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Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II



Idaho National Engineering and Environmental Laboratory

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August 2004

**Prepared for the
U.S. Department of Energy
Idaho Operations Office**

ABSTRACT

The remedial design/remedial action for Operable Unit 6-05 (Waste Area Group 6) and Operable Unit 10-04 (Waste Area Group 10)—collectively called Operable Unit 10-04—has been divided into four phases. Phase I consists of developing and implementing institutional controls at Operable Unit 10-04 sites and developing and implementing Idaho National Engineering and Environmental Laboratory-wide plans for both institutional controls and ecological monitoring. Phase II will remediate sites contaminated with trinitrotoluene and Royal Demolition Explosive. Phase III will remediate lead contamination at a gun range, and Phase IV will remediate hazards from unexploded ordnance.

This Phase II Remedial Design/Remedial Action Work Plan addresses the removal and destruction of trinitrotoluene and Royal Demolition Explosive fragments found on five sites within the Idaho National Engineering and Environmental Laboratory and remediation of soil found at the sites that was contaminated with chemical compounds (principally trinitrotoluene and Royal Demolition Explosive) during explosive tests. The following five sites are located inside the Naval Proving Ground:

- Fire Station II Zone and Range Fire Burn Area
- Experimental Field Station
- Land Mine Fuze Burn Area
- National Oceanic and Atmospheric Administration site
- Naval Ordnance Disposal Area.

The remediation of the trinitrotoluene/Royal Demolition Explosive contaminated soil sites will include establishing and maintaining institutional controls (as required) until the contamination is removed or reduced to acceptable levels, performing a visual survey to identify any unexploded ordnance and trinitrotoluene/Royal Demolition Explosive fragments and stained soil coupled with a geophysical survey for unexploded ordnance, excavation of contaminated soil, segregation and disposal of trinitrotoluene/Royal Demolition Explosive fragments at the Mass Detonation Area, sampling and analysis of soil to determine excavation requirements and when the remediation goals have been met, backfilling and contouring excavated areas, revegetating affected areas, and monitoring air and soil during the remedial action.

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ACRONYMS

ANL-W	Argonne National Laboratory-West
ARAR	applicable or relevant and appropriate requirement
BBWI	Bechtel BWXT Idaho, LLC
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFA	Central Facilities Area
CFR	Code of Federal Regulations
CRM	cultural resources management
DEQ	Department of Environmental Quality
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EOD	explosives ordnance disposal
EPA	U.S. Environmental Protection Agency
FY	fiscal year
HAD	hazard assessment document
HASP	health and safety plan
HCN	hydrogen cyanide
HMX	Her Majesty's Explosive
HQ	hazard quotient
HTRW	hazardous, toxic, and radioactive waste
ICDF	INEEL CERCLA Disposal Facility
ICP	Idaho Completion Project
IDAPA	Idaho Administrative Procedures Act
INEEL	Idaho National Engineering and Environmental Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center

IWTS	Integrated Waste Tracking System
MCP	management control procedure
MDA	Mass Detonation Area
msl	mean sea level
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NODA	Naval Ordnance Disposal Area
NPG	Naval Proving Ground
NRF	Naval Reactors Facility
OU	operable unit
PDD	program description document
PLN	plan
PPE	personal protective equipment
ppm	parts per million
QA/QC	quality assurance/quality control
RAO	remedial action objective
RCRA	Resource Conservation and Recovery Act
RD/RA	remedial design/remedial action
RDX	Royal Demolition Explosive
RI/FS	remedial investigation/feasibility study
ROD	Record of Decision
SAR	safety analysis report
TCLP	toxicity characteristic leaching procedure
TNT	trinitrotoluene
TRA	Test Reactor Area
UCL	upper confidence limit

USC	United States Code
UXO	unexploded ordnance
WAG	waste area group

Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II

1. INTRODUCTION

In accordance with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991) among the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (DEQ)—hereafter referred to as the Agencies—the U.S. Department of Energy Idaho Operations (DOE-ID) submits this Remedial Design/Remedial Action (RD/RA) Work Plan for Operable Unit (OU) 10-04. Under the current remediation management strategy outlined in the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991), the location identified for the remedial action—hereafter referred to as OU 10-04—is designated as Waste Area Group (WAG) 6, OU 6-05, Experimental Breeder Reactor I/Boiling Water Reactor Experiment Area and WAG 10, OU 10-04 Miscellaneous Sites at the Idaho National Engineering and Environmental Laboratory (INEEL). Waste Area Group 10 also includes OU 10-08, which was added to address INEEL-wide groundwater issues and new sites that are passed by other groups to WAG 10. Operable Unit 10-08 will prepare a separate OU 10-08 comprehensive remedial investigation/feasibility study (RI/FS) and Record of Decision (ROD). Therefore, OU 10-04 will not address INEEL-wide groundwater issues or potential new sites.

As required by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.), the OU 10-04 remedial action will proceed in accordance with the *Record of Decision, Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Operable Units 6-05 and 10-04* (DOE-ID 2002). The OU 10-04 ROD (DOE-ID 2002) presents the selected remedies for 50 surface sites evaluated under the *Comprehensive Remedial Investigation/Feasibility Study for Waste Area Groups 6 and 10 Operable Unit 10-04* (DOE-ID 2001).

The remedial action for OU 10-04 is divided into four phases. Phase I consists of developing and implementing institutional controls at OU 10-04 sites and developing and implementing INEEL-wide plans for both institutional controls and ecological monitoring. Phase II will remediate sites contaminated with trinitrotoluene (TNT) and Royal Demolition Explosive (RDX). Phase III will remediate lead contamination at a gun range, and Phase IV will remediate hazards associated with unexploded ordnance (UXO). Separate RD/RA work plans will be submitted for each phase of remediation. The scope and schedule for implementing these phases of remediation are presented in *Operable Units 6-05 and 10-04, Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Remedial Design/Remedial Action Scope of Work* (DOE-ID 2003).

During the 1940s, much of the area now designated as the INEEL was used by the military for testing long navy guns and for bombing practice. Most of the ordnance, UXO, and ordnance-related areas at the INEEL result from ordnance testing, demolition of explosives, and bombing practice and are located within the contiguous area of the Naval Proving Ground (NPG). Phase II activities will require the removal and destruction of TNT and RDX fragments found on five sites within the INEEL and remediation of soil found at the sites that is contaminated with chemical compounds (principally TNT and RDX). The soil was contaminated during explosive tests. The five sites located inside the NPG include the following:

- Fire Station II Zone and Range Fire Burn Area

- Experimental Field Station
- Land Mine Fuze Burn Area
- National Oceanic and Atmospheric Administration (NOAA) site
- Naval Ordnance Disposal Area (NODA).

1.1 Work Plan Organization

The RD/RA of Operable Units 6-05 and 10-04 is divided into the following four phases:

- Phase I—Institutional controls and ecological monitoring
- Phase II—Remediation of TNT and RDX contaminated sites
- Phase III—Remediation of the STF-02 gun range
- Phase IV—Remediation of ordnance-contaminated sites.

This RD/RA Work Plan outlines the major activities to be implemented in performing Phase II RD/RA for OU 10-04 in accordance with the ROD (DOE-ID 2002). In addition, this RD/RA Work Plan describes the sites, contaminants, project management, tasks, schedules, and cost estimates. The following are brief descriptions of the RD/RA Work Plan's sections and appendixes:

- Section 1 describes the background and history of WAGs 6 and 10 and provides an overview of the selected remedies for the areas of concern.
- Section 2 provides the design criteria, including the design codes and standards, assumptions, and quality assurance.
- Section 3 discusses the project's remedial design. A summary of the required activities is presented.
- Section 4 provides the initial evaluation of the TNT and RDX contaminated soil sites, including an evaluation of the potential risks to human health and the environment. Descriptions of existing site conditions, potential migration and exposure pathways, and an assessment of exposure routes are provided. In addition, the remedial action objectives (RAOs) and applicable or relevant and appropriate requirements (ARARs) are identified.
- Section 5 outlines the OU 6-05 and 10-04 Remedial Action Work Plan. This section includes the necessary steps and documentation required for completing the remedial action of the contaminated soil sites, as described in Sections 1–4. The required work tasks, project cost estimates, inspections, environmental and safety plans, and sampling and analysis plans are discussed in this section.
- Section 6 describes the necessary actions involved for each 5-year review to occur after the remedial action has taken place.
- Section 7 lists reference material.

- Appendix A presents the cultural resources summary.
- Appendix B presents a summary of the air emissions modeling to satisfy project ARARs.
- Appendix C describes the management and disposal of waste generated during Phase II activities.
- Appendix D contains the environmental checklist.
- Attachment 1 contains the technical specifications that provide the general terms and conditions required to complete the remedial action.

In addition, four separate documents are associated with this RD/RA Work Plan:

- The *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004a) describes the sampling and analyses required during Phase II activities
- The *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning* (DOE-ID 2004b) describes the necessary steps required to ensure project data quality
- The *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004) describes the possible hazards and the required steps to protect the health and safety of project workers
- The *Operations and Maintenance Plan for Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004c) describes the long-term operations and maintenance activities that will be conducted at the TNT/RDX contaminated soil sites.

1.2 Background

Located 51 km (32 mi) west of Idaho Falls, Idaho, the INEEL is a government-owned/contractor-operated facility managed by the DOE (Figure 1-1). Occupying 2,305 km² (890 mi²) of the northeastern portion of the eastern Snake River Plain, the INEEL encompasses portions of five Idaho counties: (1) Butte, (2) Jefferson, (3) Bonneville, (4) Clark, and (5) Bingham.

As shown in Figure 1-2, WAG 10 is comprised of miscellaneous surface sites and liquid disposal areas throughout the INEEL that are not included within other WAGs (WAGs 1–9). Remedial action is required for five sites contaminated with TNT and RDX, as follows: TNT at the Fire Station II Zone and Range Fire Burn Area, the Experimental Field Station, Land Mine Fuze Burn Area and NOAA soil sites, and RDX at the NODA Area 2 soil site. Figure 1-3 shows the location of the five TNT/RDX contaminated sites within the NPG.

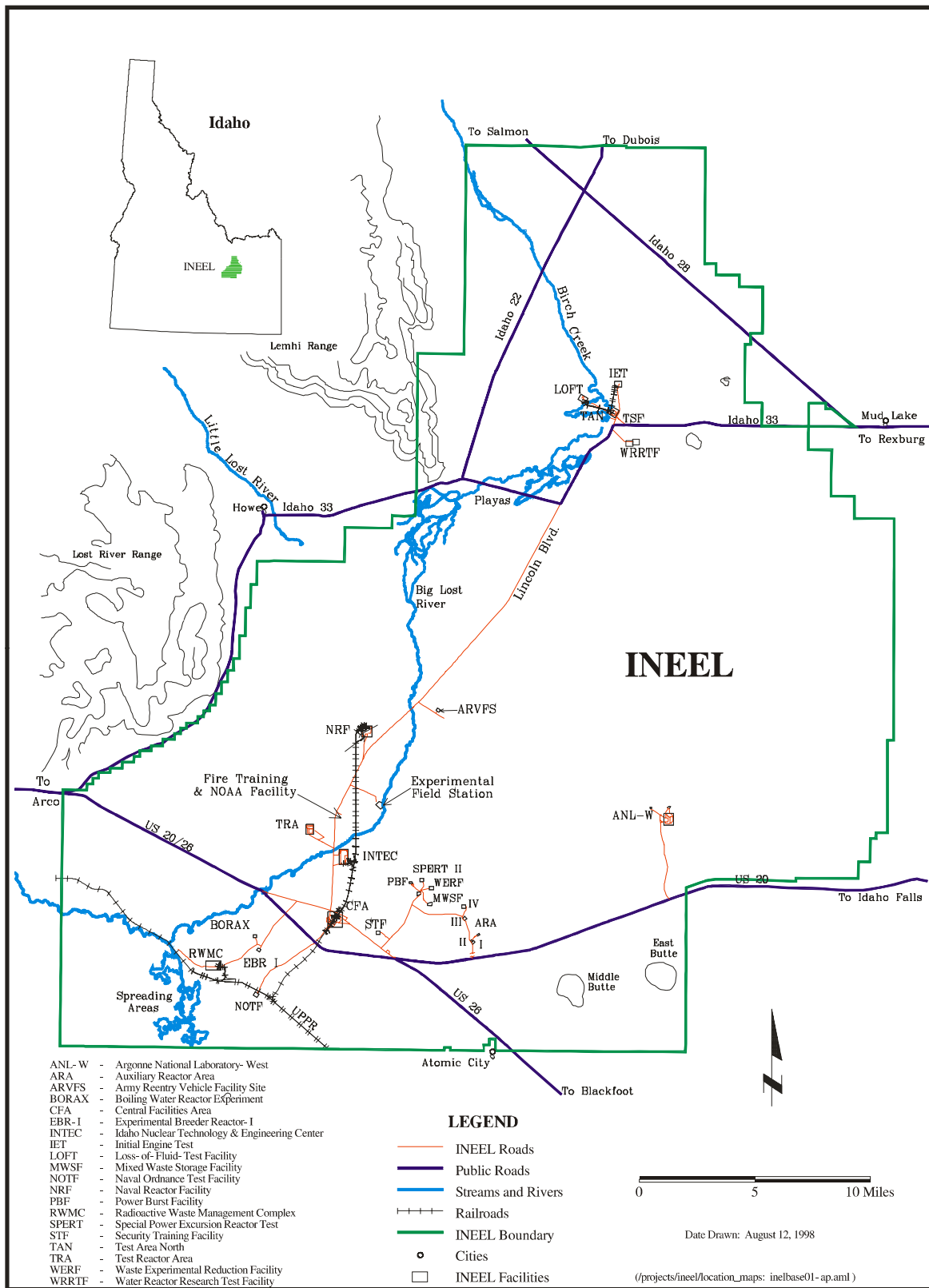


Figure 1-1. Map of the Idaho National Engineering and Environmental Laboratory showing locations of major facilities.

INEEL WAG-10 CERCLA SITES

KEY TO CERCLA Sites

Operable Site Unit	Action	Description
10-00 ARVFS-01	No Action	ARVFS Containers of Contaminated NaK
10-00 ARVFS-02	No Action	ARVFS Tank Containing Low-level Radioactive Waste (under white building)
10-00 EOCR-02	No Action	EOCR Injection Well
10-00 EOCR-03	No Action	EOCR Oxidation Pond
10-00 EOCR-04	No Action	EOCR Septic Tank
10-00 EOCR-05	No Action	EOCR Blowdown Sump (EOCR 719)
10-04 STF-01	RUFS-NSI	STF-601 Sumps and Pits
10-00 EOCR-01	No Action	EOCR Leach Pond
10-01 LCCDA-01	Track 2	LCCDA Old Disposal Pit (west end)
10-01 LCCDA-02	Track 2	LCCDA Limestone Treatment and Disposal Pit (east end)
10-01 LCCDA-EZ	Track 2	Exclusion Zone for LCCDA-01 and LCCDA-02
10-00 ZPPR-01	No Action	APPR Disposal Pit (outside ANL- W fence)
10-04 STF-02	RUFS-NSI	STF Gun Range

KEY TO ORDNANCE AREAS

Red text indicates areas with live Unexploded Ordnance (UXO)
Green text indicates areas with TNT and/or RDX soil contamination

- 1- Arco High Altitude Bombing Range
- 2- Naval Ordnance Test Facility (NOTF) (Vietnam Era) and
- 3- CFA-633 Naval Firing Site and Downrange Area
- 4- CFA Gravel Pit
- 5- CFA Sanitary Landfill Area
- 6- Naval Ordnance Disposal Area (NODA) (partially cleared)
- 7- Explosive Storage Bunkers - North of ICPP
- 8- National Oceanic & Atmospheric Administration (NOAA)
- 9- Twin Buttes Bombing Range (partially cleared)
- 10- Firestation II Zone and Range Fire Burn Area
- 11- Araconda Power Line
- 12- Old Military Structures
- 13- Mass Detonation Area
- 14- Dairy Farm Reventments
- 15- Experimental Field Station
- 16- Unexploded Ordnance East of TRA
- 17- Burn Area South of Experimental Field Station
- 18- Jelcoo- Type Structure Northwest of Experimental Field Station
- 19- Railroad Explosion Area
- 20- Unexploded Shell East of ARVFS
- 21- Juniper Mine
- 22- Projectiles Found Near Mile Markers 17, 18 and 19
- 23- Rifle Range
- 24- Landmine and Fuze Bum Area
- 25- Ordnance and Dry Explosives East of the Big Lost and North of NRF (Same as Railroad Site #19)
- 26- Zone East of the Big Lost River
- 27- Dirt Mounds Near the Experimental Field Station, NOAA, and NRF
- 28- Craters East of ICPP
- 29- Big Southern Butte
- 30- Assessed Projectile Detonation Area
- 31- Assessed Land Mine Detonation Area
- 32- 4 Live 5" Anti Aircraft Common Projectile
- 33- 30 Live 5" Anti Aircraft Common Projectile
- 34- 19 Live 5" Anti Aircraft Common Projectile and 4 Live Fuzes
- 35- Frag and RDX explosives found in and around crater
- 36- Crater with 12 plus projectiles and chunks of RDX explosives
- * - Northern Most Projectile Found (16" inert)

LEGEND

- U.S. Highways
- State Highways
- Paved or Light- Duty Roads
- RailRoad Tracks
- Rivers and Streams
- Buttes
- INEEL Boundary
- Spreading Areas and Playas
- Live Ordnance Areas
- Assessed or Cleared Ordnance Areas
- Down Range Ordnance Area
- Cities and Towns

Project: N/A
Map Requestor: Tom Honey
GIS Analyst: Dan Mahnani
Date Drawn: June 13, 2001
Disclaimer: Live unexploded ordnance mapped with Trimble Pro XRS sub- meter GPS. CERCLA Sites located via conventional site survey and survey grade Trimble 4800 GPS equipment.
Path: /projects/ineel/wag10_cerclases/
File Name: cercla_sites_2001-bl_v1
Control #: N/A



Figure 1-2. Location of Waste Area Group 10 Comprehensive Environmental Response, Compensation, and Liability Act sites at the Idaho National Engineering and Environmental Laboratory.

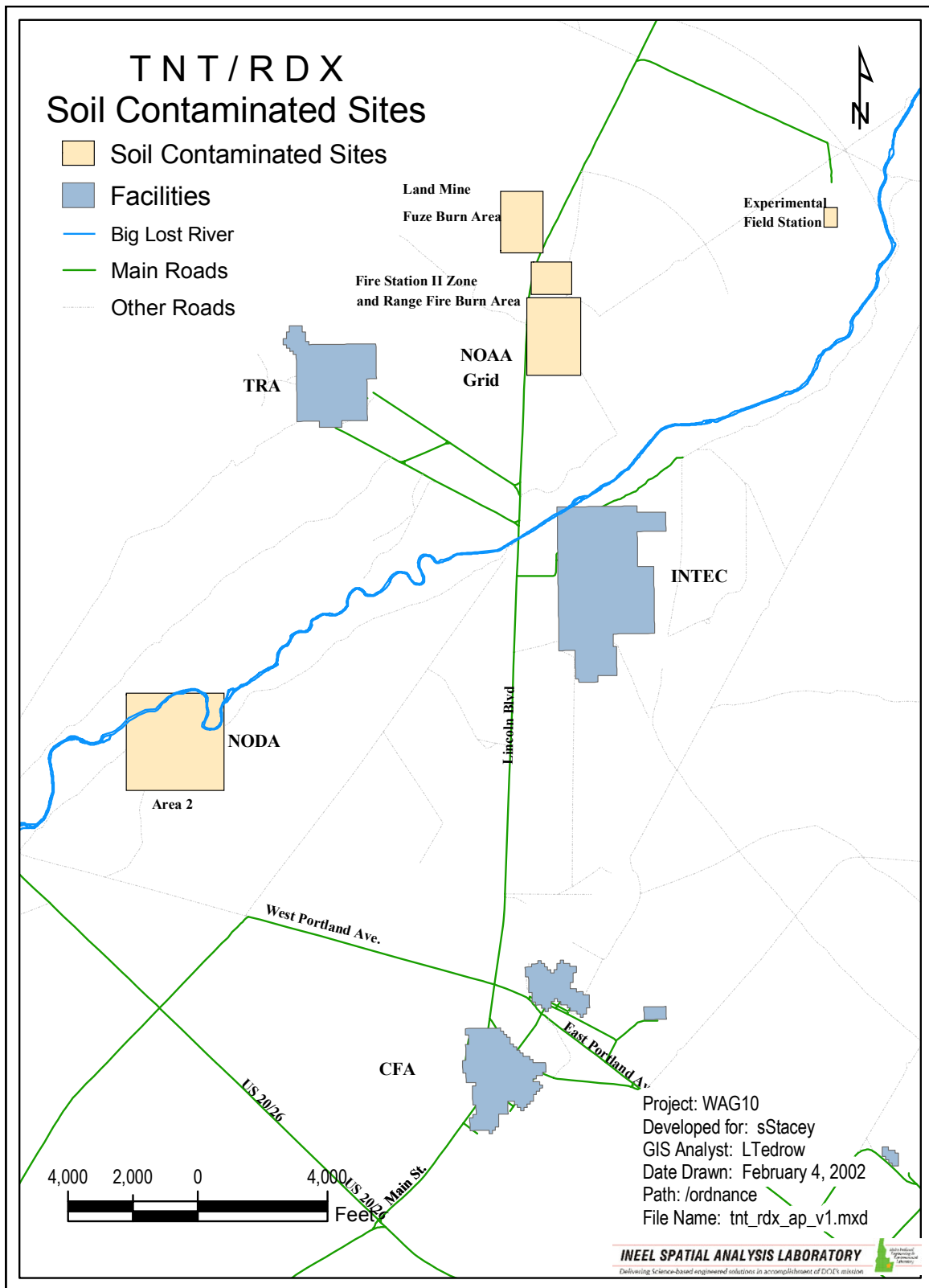


Figure 1-3. Location of soil sites contaminated with trinitrotoluene/Royal Demolition Explosive.

1.2.1 Fire Station II Zone and Range Fire Burn Area

The Fire Station II Zone and Range Fire Burn Area is located adjacent to the Fire Station II training site for the INEEL Fire Department (see Figure 1-3). It is located just east of Lincoln Boulevard at Mile Marker 5 and includes an area approximately 13 ha (33 acres) in size, although the actual contamination is restricted to approximately 750 m² (900 yd²). Early NPG activities at the site included some low-order bomb detonations that scattered UXO and pieces of explosives over several areas of the site. In the early 1970s, the entire 320-ha (800-acre) area was engulfed in a range fire that reportedly burned some UXO. More detailed information pertaining to the Fire Station II Zone and Range Fire Burn Area can be found in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001).

1.2.2 Experimental Field Station

The Experimental Field Station is located within the NPG gunnery range approximately 9.7 km (6 mi) downrange and northeast of the Central Facilities Area (CFA) -633 NPG firing site and approximately 0.4 km (0.25 mi) west of the Big Lost River channel (see Figure 1-3). The site is an estimated 2 ha (5 acres) (DOE-ID 2001), although the actual contamination is restricted to approximately 510 m² (610 yd²). This site includes multiple craters within which a variety of explosive tests were conducted. The site is known to contain UXO, pieces of explosives, structural debris, and soil contamination. More detailed information about the Experimental Field Station can be found in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001).

1.2.3 Land Mine Fuze Burn Area

The Land Mine Fuze Burn Area is 0.8 km (0.5 mi) west of Lincoln Boulevard and approximately 0.8 km (0.5 mi) north of the Fire Station II training area (Mile Marker 5) (see Figure 1-3). The site consists of approximately five separate ordnance disposal locations in an 8.1-ha (20-acre) area between a meander of a former channel of the Big Lost River and an old abandoned irrigation canal that was hand-dug in the early 1900s (DOE-ID 2001). Based upon visual observation of the site, the contaminated area of the site is restricted to a few square meters in a single location. As described in the *Preliminary Scoping Track 2 Summary Report for Operable Unit 10-03 Ordnance* (DOE-ID 1998), the site was used by NPG personnel for disposal of land mine pressure plates and aerial bomb packaging materials and as an area to dispose of land mine fuzes by burning. More detailed information about the Land Mine Fuze Burn Area can be found in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001).

1.2.4 National Oceanic and Atmospheric Administration Site

The NOAA site is located just east of Lincoln Boulevard, approximately midway between Mile Markers 4 and 5 (see Figure 1-3). The contaminated area of the site is spread over an estimated 18.7 ha (46 acres) (DOE-ID 2001) with the actual contamination limited to less than that amount. The site was used for a variety of explosive tests or cleanup detonations or both following such tests. The area contains a number of small craters, low-ordered bomb casings and detonators, and some widely scattered pieces of explosives. The NOAA site has been and is currently used by NOAA and other governmental agencies for a variety of atmospheric, geodetic, and weather-related monitoring and research work. More detailed information about the NOAA site can be found in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001).

1.2.5 Naval Ordnance Disposal Area

The NODA site is located approximately 1.6 km (1 mi) northeast of U.S. Highway 20/26 between Mile Markers 266 and 267 and about 3.2 km (2 mi) halfway from the Test Reactor Area (TRA), Idaho Nuclear Technology and Engineering Center (INTEC), and CFA facilities at the INEEL, as shown in Figure 1-3. The NODA was reportedly used by the U.S. Navy as an ordnance and nonradioactive

hazardous material disposal area during the 1940s. Following the establishment of the National Reactor Testing Station (now the INEEL), the NODA came under control of the U.S. Atomic Energy Commission (now DOE). From about 1967 to 1985, approximately 3,175 kg (7,000 lb) of reactive materials was treated (burned) at the NODA. Between 1967 and 1985, the NODA also was used as a storage area for hazardous waste generated at the INEEL. Solvents, corrosives, ignitable materials, heavy-metal-contaminated solutions, formaldehyde, polychlorinated biphenyl materials, waste laboratory chemicals, and reactive materials were stored at this site until 1982. By October 1985, all these materials had been removed for off-Site disposal as hazardous waste or treated on-Site by open burning, as allowed by Resource Conservation and Recovery Act (RCRA) regulations (DOE-ID 1998).

In 1985, the NODA was added to the RCRA, Part A, permit application as a thermal treatment unit. The last treatment of hazardous waste occurred in 1988 (except for one emergency action/detonation in 1990). In June 1990, a Memorandum of Understanding was developed between the Environmental Programs and Waste Reduction Operations Complex, under which the Environmental Programs agreed to fund and manage all activities necessary to formally close the NODA, including soil sampling and analysis, removal of contaminated soil, emergency removal of ordnance, maintenance of access signs and barricades, and preparation and submittal of all required documentation. In 1997, the DEQ terminated the Interim Status of the NODA with the agreement that the CERCLA Program would perform the final evaluation of the site in accordance with the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991).

The 1994 removal action defined the cleanup area as 16 ha (40 acres) centered approximately 762 m (2,500 ft) north of the current INEEL security force gun range on Portland Avenue (DOE-ID 2001). Based upon visual observation, the area of contamination at the NODA Area 2 site is restricted to a few square meters within a single crater. More detailed information about the NODA site can be found in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001).

1.3 Selected Remedy

The remedial alternatives developed to address TNT/RDX contaminated soil sites include the following:

- Alternative 1: No action
- Alternative 2: Limited action
- Alternative 3: Removal, ex situ treatment, and disposal or return to excavations
- Alternative 3a: Removal, treatment of TNT/RDX fragments, and disposal of soil at the INEEL
- Alternative 3b: Removal, treatment of TNT/RDX fragments, and disposal of soil off the INEEL
- Alternative 4: Removal, ex situ treatment, and disposal or return to excavations
- Alternative 4a: Removal, off-Site incineration, and disposal
- Alternative 4b: Removal, on-Site soil composting, and return of soil to the excavations.

Based upon consideration of the requirements of CERCLA, the detailed analysis of alternatives, and public comments, the Agencies have selected Alternative 3a (removal, treatment, and disposal of soil on the INEEL) and institutional controls as the remedy for the TNT/RDX contaminated soil sites at

OU 10-04. Performance standards were implemented as design criteria for each site to ensure that the selected remedy protects human health and the environment.

2. DESIGN BASIS

2.1 General Description of Project Components

The project components (support facilities, electrical power, and project execution services) are described in the following subsections.

2.1.1 Support Facilities

The support facilities to be used during field operations include field office trailer(s), parking area, and lay-down areas. A supply trailer(s) will be required for field use. Parking for personnel vehicles will be established at each task site with approval of the project office. Lay-down areas will be designated at each task site.

2.1.2 Electrical Power

Electrical power is not available at any of the five task sites. Therefore, if power is required for field operations, electrical generators must be provided.

2.1.3 Project Execution Services

Project execution services (e.g., ensuring design specifications are met and reviewing and improving construction interface documents) will be provided by Bechtel BWXT Idaho, LLC (BBWI) on an as-needed basis. In addition, engineering support will be provided during pre-field operation activities, field operation activities, and at-field operations closeout. During field operation activities, appropriate BBWI personnel will review and evaluate field changes.

2.2 Design Criteria

2.2.1 Management Control Procedures

The project definition, project planning, project execution, and project acceptance and closeout phases will be performed in accordance with pertinent BBWI internal company procedures. Pertinent internal company procedures for this project are those identifying requirements in the following areas:

- Engineering design
- Emergency preparedness and management
- Fire protection
- Management systems
- Occupational safety and health
- Radiological protection (if required)
- Security
- Environmental restoration

- Waste management
- Conduct of operations and maintenance
- Quality
- Cultural resources.

The objective of this remedial action is to inhibit the potential exposure for human and environmental receptors and to minimize the spread of contamination and potential impact on the Snake River Plain Aquifer. The following section describes the activities at the TNT/RDX contaminated soil sites covered under the Phase II activities.

2.2.2 Contaminated Soil Sites

The selected remedy for the OU 10-04 TNT/RDX contaminated soil sites is removal, treatment, disposal of soil on the INEEL, and institutional controls. This remedy was selected based on the results of the comparative analysis of alternatives with the selected remedy being protective of human health and the environment and in compliance with laws. The long-term effectiveness is high, because TNT/RDX contamination will be removed to prescribed levels. Reduction of toxicity, mobility, and volume is moderate. Although TNT and RDX fragments would be removed and detonated, the contaminated soil would be removed and disposed of but not treated. However, the contaminants would be contained, thereby protecting humans and ecological receptors from exposure. Short-term effectiveness would be moderate because of the possibility for worker exposure during excavation, treatment, transport, and disposal activities. The ability to implement the remedial action is high, because equipment, technologies, and personnel are all available.

Remediation of the TNT/RDX contaminated soil sites will include the following activities:

- Establish and maintain institutional controls (such as access controls and land-use restrictions) and other restrictions (such as signs and fences) until the TNT/RDX contamination is removed or reduced to acceptable levels. The specific goals of the institutional controls are to control human activity at sites with TNT/RDX contamination and prevent harm from direct exposure to toxic chemicals. Institutional controls will restrict access, and monitoring will be performed since buried, undetected TNT and RDX fragments could exist after remediation.
- Perform a visual survey for UXO and TNT/RDX fragments and stained soil. Perform a geophysical survey for UXO.
- Excavate soil contaminated with concentrations in excess of the remediation goals by hand unless it is determined that mechanical excavation equipment can be used. If large contaminated areas are encountered (e.g., greater than 2 m [6.6 ft] in diameter), then mechanical excavation equipment will be used, provided that the job safety analysis does not preclude its use. The UXO will be removed, if required, to proceed with soil excavation. Otherwise, UXO removal will be performed during remediation of the ordnance areas.
- Manually segregate fragments of TNT/RDX from the soil unless a safety assessment indicates it is safe to mechanically screen the soil. A job safety analysis will be prepared prior to implementation of field activities and will be received by management and appropriate safety personnel to determine whether mechanical screening equipment can be used (refer to Section 5.4.3).

- Dispose of the TNT/RDX fragments by detonation at the Mass Detonation Area (MDA) (unless safety concerns preclude recovery and transport of the fragments to the MDA, in which case the fragments will be detonated in place). Waste generated during detonation activities will be addressed using current disposal practices as outlined in Appendix C.
- Use field screening methods and/or soil sampling with laboratory analysis to determine the extent of soil removal required to meet remediation goals.
- Sample and analyze removed soil to determine the TNT and RDX concentrations and if the soil exhibits any RCRA hazardous waste characteristics. If the soil is less than 10% TNT and RDX and is not RCRA regulated, it will be disposed of at an approved landfill on or off the INEEL. If the TNT and RDX concentration is above 10% and considered RCRA regulated, the soil will be transported to a permitted RCRA treatment and disposal facility for thermal treatment and disposal.
- Backfill areas excavated to depths greater than 0.3 m (1 ft) with uncontaminated soil or contour to match the surrounding terrain and revegetate provided that a minimum of 0.3 m (1 ft) of topsoil remains to support vegetation.
- Monitor air and soil until the TNT/RDX contamination and UXO contamination are removed or reduced to allow unrestricted use.

Secondary explosives (TNT, Her Majesty's Explosive [HMX], and RDX) have historically been discussed in terms of safety-related issues as pertaining to a Hazardous, Toxic, and Radioactive Waste (HTRW) classification. The Omaha HTRW Center is the U.S. Army Corp of Engineers resource pertaining to hazardous waste determinations. The HTRW Center of Expertise has concluded that, for environmental media contaminated with secondary explosives at a concentration of 10% or greater, and in the absence of testing site-specific soil for detonation or deflagration, these types of soil should be considered RCRA reactive and would require a D003 waste code. For the purposes of determining whether this 10% level has been exceeded, all analyte concentrations as determined by SW-846 Method 8330 (including TNT, HMX, and RDX) will be summed for comparison to this standard (EPA 2002).

The UXO surveys and removal, if required, will be performed using standard military techniques. Soil will be characterized and excavated either manually or mechanically, as permitted by safety analysis. Air and soil monitoring will be performed during excavation activities, as directed by the safety documentation or industrial hygienist. The TNT and RDX fragments will be segregated from the soil and detonated at the MDA. Sampling will be performed to determine if products of incomplete combustion are present after detonation events at the MDA. Although detectable levels are not expected, remediation of MDA soil contamination will be performed after remediation if residual risk exceeds $1\text{E-}04$. Therefore, the MDA will be investigated for remediation following the completion of Phase IV UXO remediation activities. In the interim, institutional controls consisting of visible access restrictions and control of drilling and excavation activities will be maintained in accordance with the *INEEL Site-wide Institutional Controls Plan* (DOE-ID 2004d).

Following separation of the TNT and RDX fragments, the contaminated soil will be disposed of at an approved facility on or off the INEEL. Verification sampling will be performed to confirm that soil above the remediation goals is removed. The sites will be restored in accordance with INEEL revegetation procedures.

Institutional controls will be maintained at these sites until the TNT/RDX contamination is removed or reduced to acceptable levels. Controls are required to restrain human activity at areas with

TNT/RDX contamination and prevent harm from direct exposure to toxic and hazardous secondary explosive material. In April 1999, the EPA Region 10 developed a policy for institutional controls. During this OU 10-04 RD/RA phase for the TNT/RDX contaminated soil sites, an operations and maintenance plan has been developed that contains the institutional controls for the TNT/RDX sites that will follow the guidelines in the policy. The operations and maintenance plan establishes uniform requirements of the institutional control remedy components for all TNT/RDX sites and specifies the monitoring and maintenance requirements.

Institutional controls will reside with DOE or other government agency until 2095, based on the *INEEL Comprehensive Facility and Land Use Plan* (DOE-ID 2004e), or until a remedy review or INEEL-wide 5-year statutory review concludes unrestricted land use is allowable.

2.3 U.S. Department of Energy Related Codes, Standards, and Documents

The following DOE-related codes, standards, and documents will be used as the basis for remediation of the TNT/RDX contaminated soil sites:

- *Record of Decision, Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Operable Units 6-05 and 10-04* (DOE-ID 2002)
- DOE Order 231.1A, “Environment, Safety, and Health Reporting”
- DOE Order 414.1B, “Quality Assurance”
- DOE Order 435.1, “Radioactive Waste Management”
- DOE Order 440.1A, “Worker Protection Management for DOE Federal and Contractor Employees”
- DOE Order 450.1, “Environmental Protection Program”
- DOE Order 460.1B, “Packaging and Transportation Safety”
- DOE Order 5400.5, “Radiation Protection of the Public and the Environment”
- DOE Order 5480.4, “Environmental Protection, Safety, and Health Protection Standards”
- DOE Order 5480.19, “Conduct of Operations Requirements for DOE Facilities”
- DOE Manual 231.1-1A, “Environment, Safety, and Health Reporting Manual”
- DOE Manual 231.1-2, “Occurrence Reporting and Processing of Operations Information”
- DOE Manual 435.1-1, “Radioactive Waste Management Manual”
- DOE Manual 440.1-1, “DOE Explosives Safety Manual”
- DOE-ID Order 420.A, “Fire Safety Program”
- DOE-ID Manual 451.A-1, “National Environmental Policy Act (NEPA) Planning and Compliance Program Manual.”

2.4 Engineering Standards

Attachment 1, “Construction Specification,” contains references to the latest engineering standards and the specifications to which they apply.

2.5 Environmental and Safety

The following is a list of potential chemical-specific and action-specific ARARs identified in the OU 10-04 ROD (DOE-ID 2002). A detailed discussion of the ARARs is presented in Section 4.2.

Chemical-specific ARAR:

- Idaho Administrative Procedures Act (IDAPA) 58.01.11.200, “Ground Water Quality Standards.”

Action-specific ARARs:

- IDAPA 58.01.01.650, “Rules for Control of Fugitive Dust”
- IDAPA 58.01.01.651, “General Rules”
- IDAPA 58.01.05.006, “Standards Applicable to Generators of Hazardous Waste”
- IDAPA 58.01.05.008, “Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities”
- 40 *Code of Federal Regulations* (CFR) 262.11, “Hazardous Waste Determination”
- 40 CFR 264.1(j)(1–13), “Purpose, Scope, and Applicability”
- 40 CFR 264.114, “Disposal or Decontamination of Equipment, Structures, and Soils”
- 40 CFR 264.171, “Condition of Containers”
- 40 CFR 264.172, “Compatibility of Waste with Containers”
- 40 CFR 264.173, “Management of Containers”
- 40 CFR 264.174, “Inspections”
- 40 CFR 264.175, “Containment”
- 40 CFR 264.176, “Special Requirements for Ignitable or Reactive Waste”
- 40 CFR 264.177, “Special Requirements for Incompatible Wastes”
- 40 CFR 265.382, “Open Burning; Waste Explosives”
- 40 CFR 266.205, “Standards Applicable to the Storage of Solid Waste Military Munitions”
- 40 CFR 266.206, “Standards Applicable to the Treatment and Disposal of Waste Military Munitions.”

Location-specific ARARs:

- 16 USC § 470 h-2, “Historic Properties Owned or Controlled by Federal Agencies”
- 25 USC § 3002, “Ownership”
- 25 USC § 3005, “Repatriation”
- 36 CFR 800.4, “Identification of Historic Properties”
- 36 CFR 800.5, “Assessment of Adverse Effects”
- 43 CFR 10.6, “Custody”
- 43 CFR 10.10, “Repatriation.”

To be considered:

- U.S. Department of Defense (DOD) Standard 6055.9, Chapter 12, “Real Property Contaminated with Ammunition, Explosives, or Chemical Agents” (DOD 1997).

2.6 Quality Assurance

The hazard assessment document (HAD), “Removal and Detonation of Unexploded Ordnance at the INEEL Hazard Classification” (HAD-238), addresses this project’s activities. Considering that an accidental detonation could result in not more than five fatalities, the hazard classification of the Unexploded Ordnance Removal and Detonation Project is considered “moderate,” in accordance with DOE-ID Order 420.D, “Requirements and Guidance for Safety Analysis.” The safety analysis report (SAR), “Safety Analysis Document for the Removal and Detonation of Unexploded Ordnance at the INEEL” (SAR-212), identifies and evaluates the hazards associated with the removal and detonation of UXO and ordnance explosive waste as well as the remediation of soil contaminated with TNT and RDX residues. The safety analysis concludes that these activities can be conducted safely. Because no safety structures, systems, and components have been identified that must function to prevent or mitigate the consequences of an accidental detonation, a safety category designation of “consumer grade” is appropriate for the remedial activities as defined in Management Control Procedure (MCP) -540, “Documenting the Safety Category of Structures, Systems, and Components.”

The “Project Execution Plan for the Balance of INEEL Cleanup Project” (PLN-694) has been adopted for this project and is incorporated by reference. The guidance governs the functional activities, organization, and quality assurance/quality control (QA/QC) protocols that will be used for this project. The *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning* (DOE-ID 2004b) also has been adopted for this project. This plan governs the QA/QC requirements for data. The Field Sampling Plan (DOE-ID 2004a) describes the QA/QC requirements for field sampling and analysis of field survey samples. Where applicable, the technical specifications (provided in Attachment 1) will specify the QA/QC procedures for the given task, consistent with guidance provided by Plan (PLN) –694, “Project Execution Plan for the Balance of INEEL Cleanup Project.”

3. REMEDIAL DESIGN

3.1 Project Site

This section describes the remedial design for the TNT/RDX contaminated soil sites. The remedial design was developed in accordance with the engineering design criteria presented in Section 2. The civil design specifications for the action are included in Attachment 1. The following sections summarize the major aspects critical to the remedial design.

3.2 Site Contaminant Summary

The following sections summarize the contamination at the Fire Station II Zone and Range Fire Burn Area, Experimental Field Station, Land Mine Fuze Burn Area, NOAA site, and NODA.

3.2.1 Fire Station II Zone and Range Fire Burn Area

During a 1993 interim action, a 4-ha (10-acre) area of the Fire Station II Zone and Range Fire Burn Area (see Figure 3-1) was cleared to a depth of 0.61 m (2 ft) of UXO and pieces of explosives with only a few areas of explosive-contaminated soil found. Twenty samples were collected from the area and analyzed for TNT and RDX with results ranging from 0.0 to 2,141 parts per million (ppm) and 0.0 to 4.7 ppm, respectively. Areas above the TNT action levels were excavated by hand until the verification sample results met the cleanup level of 44 ppm and 18 ppm for RDX. These action levels were developed based upon a risk analysis performed in support of the development of the *Declaration of the Record of Decision for the Ordnance Interim Action, Operable Unit 10-05, Waste Area Group 10* (DOE-ID 1992). During the interim action, approximately 0.76 m³ (1 yd³) of contaminated soil was removed; therefore, no backfill of the area was required.

During a 1996 field assessment, the entire site was assessed, including the area outside the 4-ha (10-acre) site that was cleared of ordnance during the 1993 interim action. The assessment included a visual examination for signs of craters, detonation tests, surface UXO, pieces of explosives, and soil contamination. The boundary of soil contamination was extended and mapped. The burn area was covered during the sweep of the downrange area. The area outside the 4-ha (10-acre) site was walked at 10-m (33-ft) intervals. The area searched extended out to the last identified piece of TNT, which became the tentative outer boundary of the site. From this piece, the search moved laterally, until another piece of TNT could be located. The search then again extended out to confirm that no other pieces could be found and then retracted to the last peripheral piece, which was flagged as the boundary. This search process was repeated until the entire boundary was established. In addition to the Fire Station II Area, the Range Fire Burn Area also was assessed. The search team fanned out in approximately 10-m (33-ft) intervals from the Fire Station II training area and walked east and northeast toward the Experimental Field Station (DOE-ID 1998).

In 1999, surface soil samples were collected as described in the *Field Sampling Plan for Operable Unit 10-04 Explosive Compounds* (DOE-ID 1999). The results of this sampling effort were evaluated in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001). Contaminants were detected between 0 to 0.61 m (0 to 2 ft) below the ground surface; however, the highest detected concentrations were mainly located in the top 15 cm (0.5 ft) of surface soil. The maximum detected RDX concentration was 3.7 mg/kg with the maximum TNT concentration being 130 mg/kg. Although some of the UXO was removed during the 1993 and 1997 removal activities, there is still some potential for UXO to remain in the area.

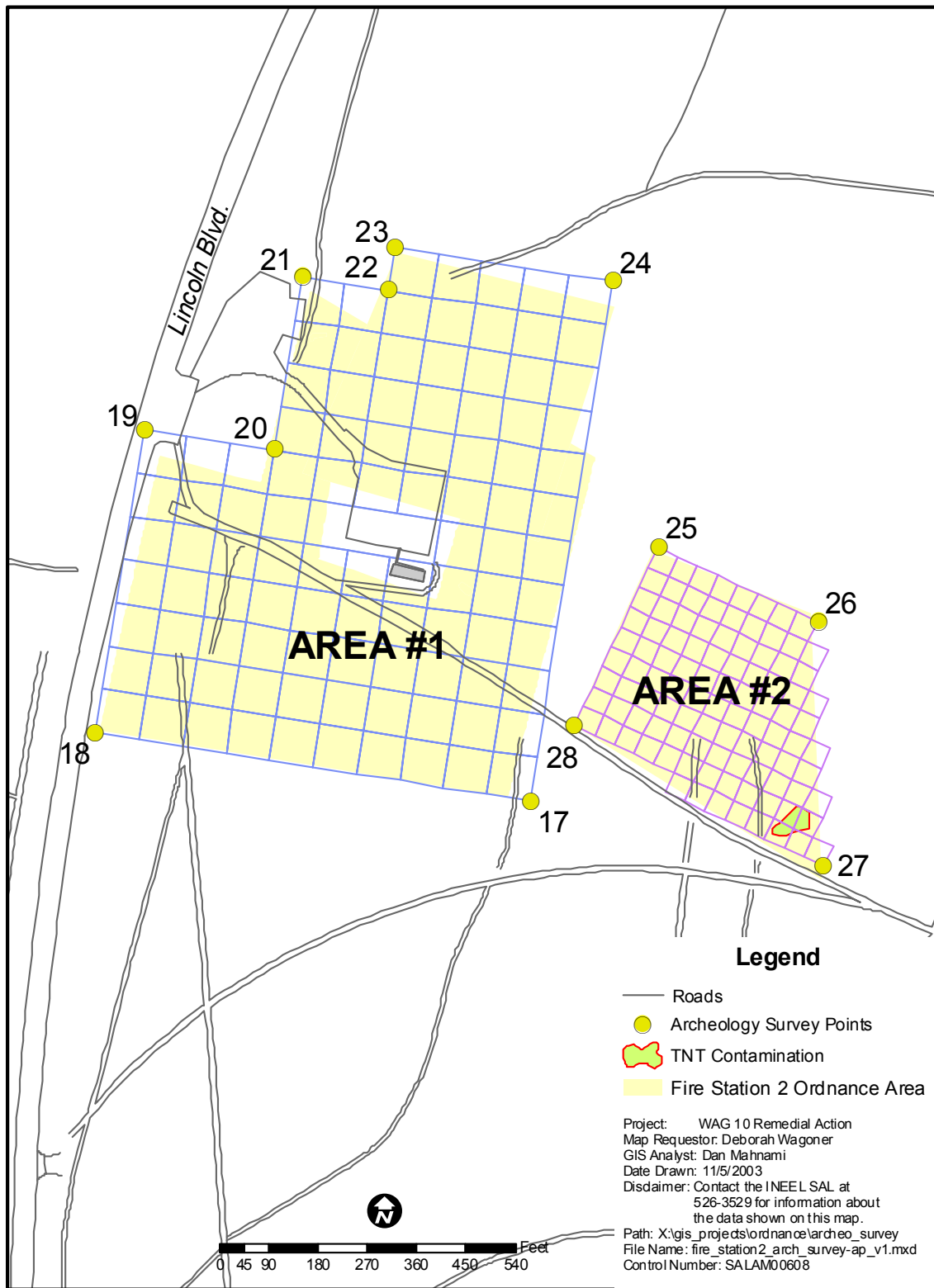


Figure 3-1. Location of the Fire Station II Zone and Range Fire Burn Area.

The Fire Station soil site was considered to represent four separate areas of contamination. For Area 1 (see Figure 3-1), the risk evaluation indicated a risk to ecological receptors from TNT. For Area 2 (see Figure 3-1), the risk evaluation indicated a risk to ecological receptors from RDX. Areas 3 and 4 had no contaminants of potential concern retained for further evaluation in the ecological risk assessment.

The human health risk assessment identified TNT as a contaminant of concern with a total risk for all pathways for the current occupational scenario being less than $1\text{E-}04$, while the noncarcinogenic hazard index is less than 1.0. The total estimated risk for all pathways for the 100-year future residential scenario is $1\text{E-}04$ from TNT with a noncarcinogenic hazard index of 12. The total estimated risk for all pathways for the 100-year future occupational scenario is less than $1\text{E-}04$ with a noncarcinogenic hazard index of less than 1.0. The ecological risk assessment identified both RDX and TNT as contaminants of concern for ecological receptors. The hazard quotients (HQs) for exposure to RDX in the surface and subsurface soil ranged from 2 for the mule deer to a maximum of 40 for the pygmy rabbit. The deer mouse also has HQs exceeding 1.0. The HQs for exposure to TNT in the surface and subsurface soil range from 9 for the deer mouse to a maximum of 20 for the pygmy rabbit. The pygmy rabbit is classified as a species of special concern by the State of Idaho.

3.2.2 Experimental Field Station

The 1996 field team encountered remnants of World War I and World War II vintage bombs and two areas of widespread heavy concentrations of explosive-contaminated soil in the vicinity of the Experimental Field Station (see Figure 3-2). One area was approximately 0.8 ha (2 acres) in size with the second area being approximately 0.3 ha (0.8 acres). The assessment included a visual examination for signs of craters, detonation test, surface UXO, pieces of explosives, and soil contamination. The area was searched for UXO using 10-m (33-ft) sweeps. When the team encountered areas of TNT contamination, the region was examined in greater detail and the area was mapped. Several large craters were located in this area; however, no ordnance was found in any of the craters. The craters appear to have resulted from ordnance destruction or testing. Approximately 2.4 km (1.5 mi) away, the nose section of a World War I vintage bomb with TNT and an empty tail section of a World War I vintage bomb were found during the assessment and transported to the MDA for disposal by detonation.

In 1999, surface soil samples were collected as described in the *Field Sampling Plan for Operable Unit 10-04 Explosive Compounds* (DOE-ID 1999). Nineteen samples were collected and analyzed with the results of the sampling effort evaluated in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001). Contaminants were detected between 0 to 0.61 m (0 to 2 ft) below the ground surface; however, the highest detected concentrations were mainly located in the top 15 cm (0.5 ft) of the surface soil. The maximum detected 1,3-dinitrobenzene concentration was 14 mg/kg with a maximum TNT concentration of 1,100 mg/kg. There is still some potential for UXO to remain at this site.

The human health risk assessment identified TNT as a contaminant of concern based on human health risk estimates. The exposure pathway of concern is ingestion of homegrown produce. The total risk for all pathways for the current occupational scenario is less than $1\text{E-}04$ with a noncarcinogenic hazard index equal to 1.0. The total estimated risk for all pathways for the 100-year future residential scenario is slightly less than $1\text{E-}04$ with a noncarcinogenic hazard index of 10, primarily from TNT. The total estimated risk for all pathways for the 100-year occupational scenario is less than $1\text{E-}04$ with a noncarcinogenic hazard index equal to 1.0. Both 1,3-dinitrobenzene and TNT were identified as contaminants of concern for ecological receptors. The HQs for exposure to 1,3-dinitrobenzene in the surface and subsurface soil ranged from 30 for the deer mouse to a maximum of 80 for the pygmy rabbit. The HQs for exposure to TNT in the surface and subsurface soil range from 200 for the deer mouse to a maximum of 300 for the pygmy rabbit. The pygmy rabbit is classified as a species of special concern by the State of Idaho.

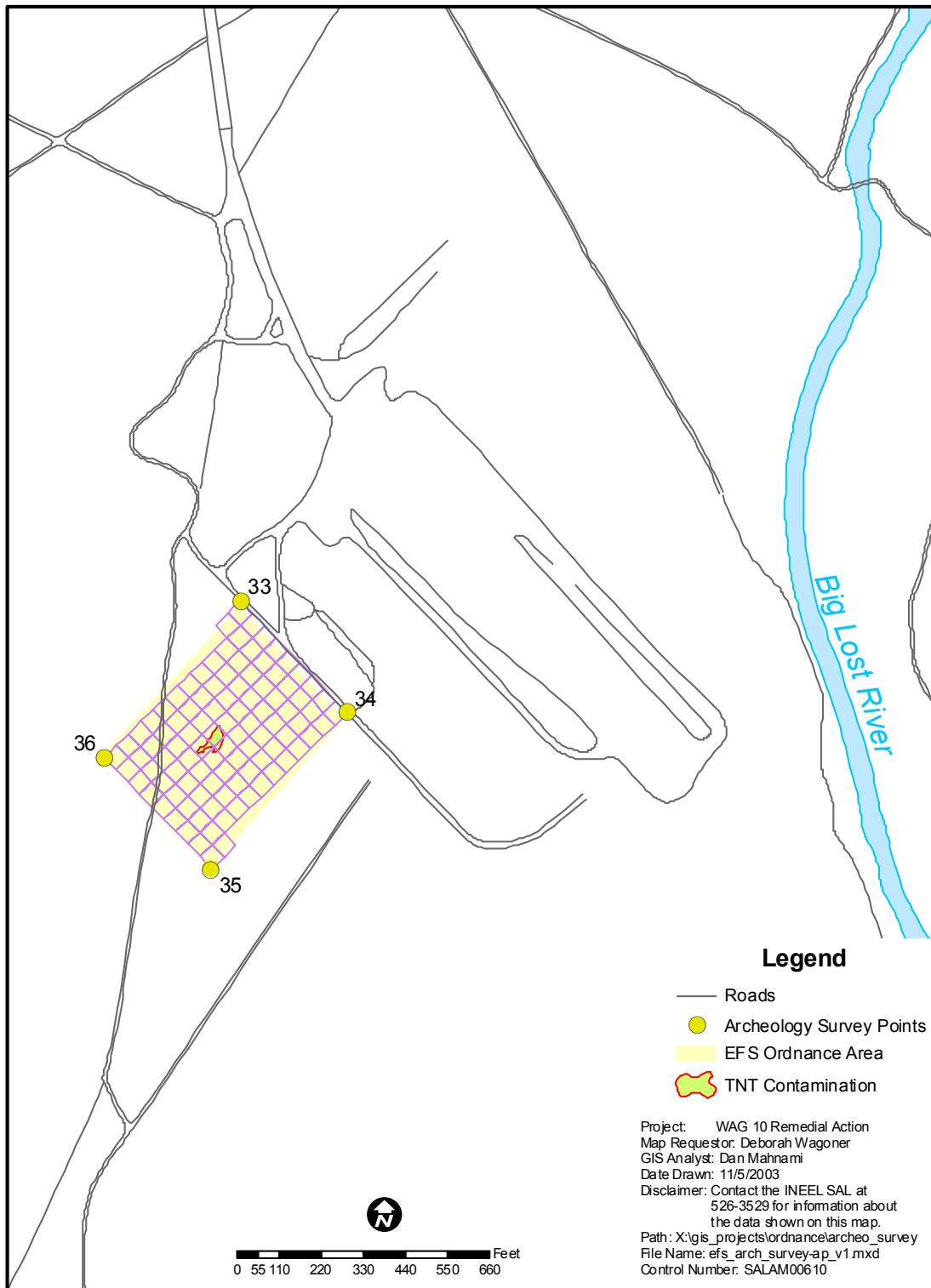


Figure 3-2. Location of the Experimental Field Station.

3.2.3 Land Mine Fuze Burn Area

During the 1996 field assessment, the perimeter of the Land Mine Fuze Burn Area was established, and the area for the 1996 removal action was defined (see Figure 3-3). The subsurface was characterized using geophysical methods during a Technology Demonstration Project in June 1996. Approximately 0.6 ha (1.5 acres) was surveyed to a depth of 0.61 m (2 ft) and the area was mapped.

During the 1996 removal action, 8.1 ha (20 acres) was surface-cleared of land mine fuzes and mine pressure plates, characterized using geophysical methods, and mapped. A subsurface clearance was not performed, based on the removal action subcontractor's evaluation of the data; however, during the INEEL quality check of the results of the action on the subsurface at this site, several inert items were found and excavated (DOE-ID 1998). Although some UXO was removed during this removal action, there is still potential for UXO to remain in the area.

In 1999, surface samples were collected as described in the *Field Sampling Plan for Operable Unit 10-04 Explosive Compounds* (DOE-ID 1999). The results of this sampling effort were evaluated in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001). Contaminants were detected between 0 to 0.61 m (0 to 2 ft) below the ground surface; however, the highest detected concentrations were mainly located in the top 15 cm (0.5 ft) of the surface soil. The maximum detected TNT concentration was 79,000 mg/kg.

The human health risk assessment identified TNT as a contaminant of concern based on the human health risk estimates. The exposure pathways of concern are ingestion of soil, groundwater, and homegrown produce. The total risk for all pathways for the current occupational scenario is 4E-03 with a noncarcinogenic hazard index of 70. The total estimated risk for all pathways for the 100-year future residential scenario is 6E-03 with a noncarcinogenic hazard index of 700. The total estimated risk for all pathways for the 100-year future occupational scenario is 4E-03 with a noncarcinogenic hazard index of 70. The ecological risk assessment identified TNT as a contaminant of concern in Area 3 for ecological receptors. The HQs for exposure to TNT in the surface and subsurface soil range from 900 for the deer mouse to a maximum of 10,000 for the pygmy rabbit. The pygmy rabbit is classified as a species of special concern by the State of Idaho.

3.2.4 National Oceanic and Atmospheric Administration Site

The location of the NOAA area is shown in Figure 3-4. During the 1993 interim action, a surface clearance and a geophysical survey were performed to a depth of 0.61 m (2 ft) on a large site consisting of 1.7 ha (4.13 acres) and a small site consisting of 0.88 ha (2.17 acres). No UXO was found below the surface, but pieces of TNT remained at the surface following the action. The materials removed during the 1993 action included a 250-lb bomb casing, two 3-in. projectile flare candles, one electrical squib, and pieces of TNT found on the surface. No actual excavation took place or any subsequent backfilling of the area.

During the 1996 field assessment, the major objectives of the field team were to determine whether ordnance or soil contamination existed outside the previously identified area, to establish the boundary, to re-estimate the volume of contaminated soil, and to look for any indications that detonation pits existed in the area. Field crews searched the area on foot at approximately 10-m (33-ft) intervals locating scattered TNT ranging in size from small flakes to baseball-size chunks. The area of contamination covers a large area of the site. Several craters that appeared to be sites of ordnance destruction were located on the south side of the site. Several partial 100-lb bombs were found southeast of the site, which indicates they had been intentionally *low-ordered*. A low-order detonation is the result of a low-order procedure intended to detonate an explosive item without causing the item to totally consume itself. A low-order procedure is performed in an area that could not withstand a high-order detonation, which would totally consume the item.

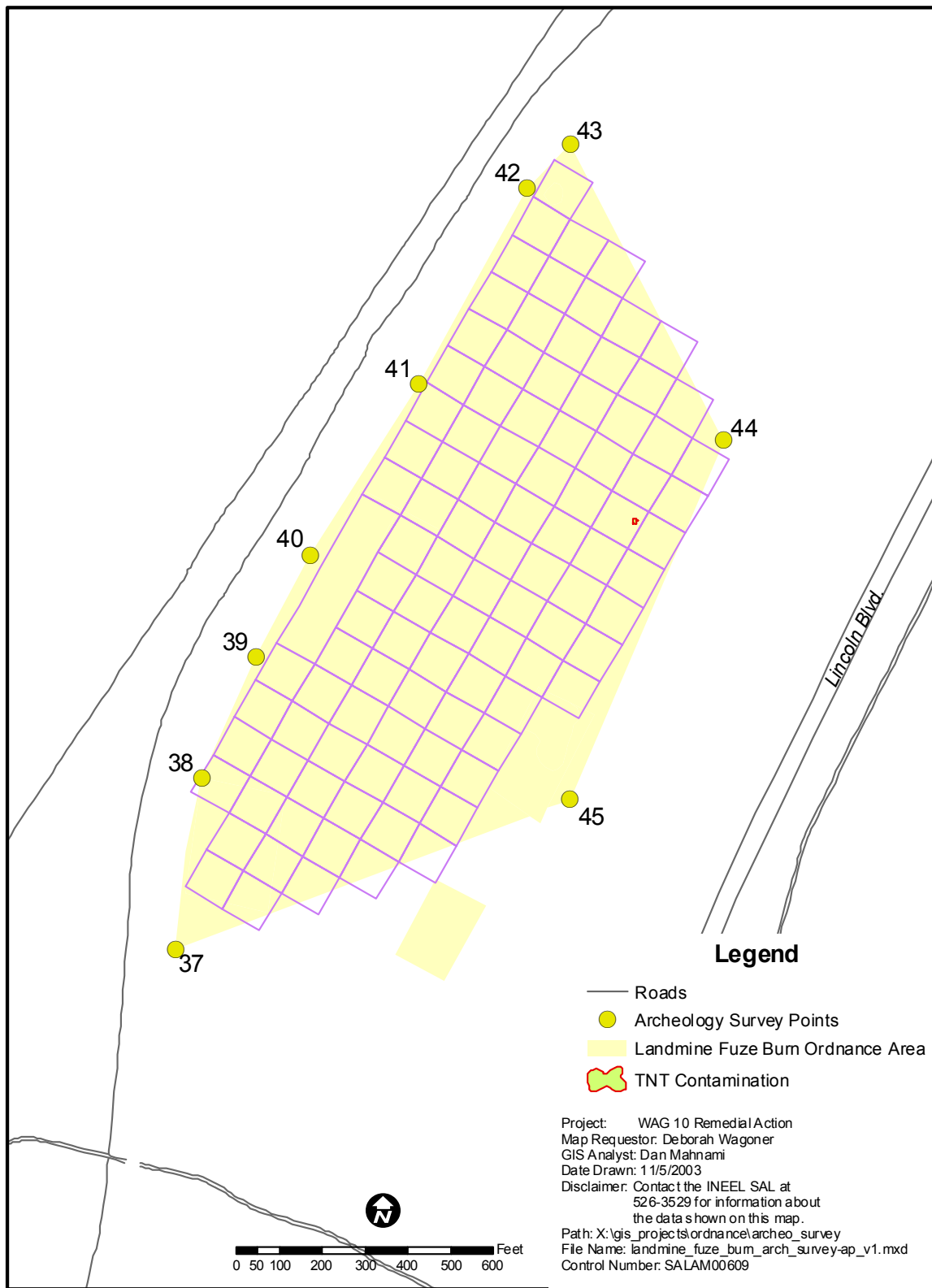


Figure 3-3. Location of the Land Mine Fuze Burn Area.

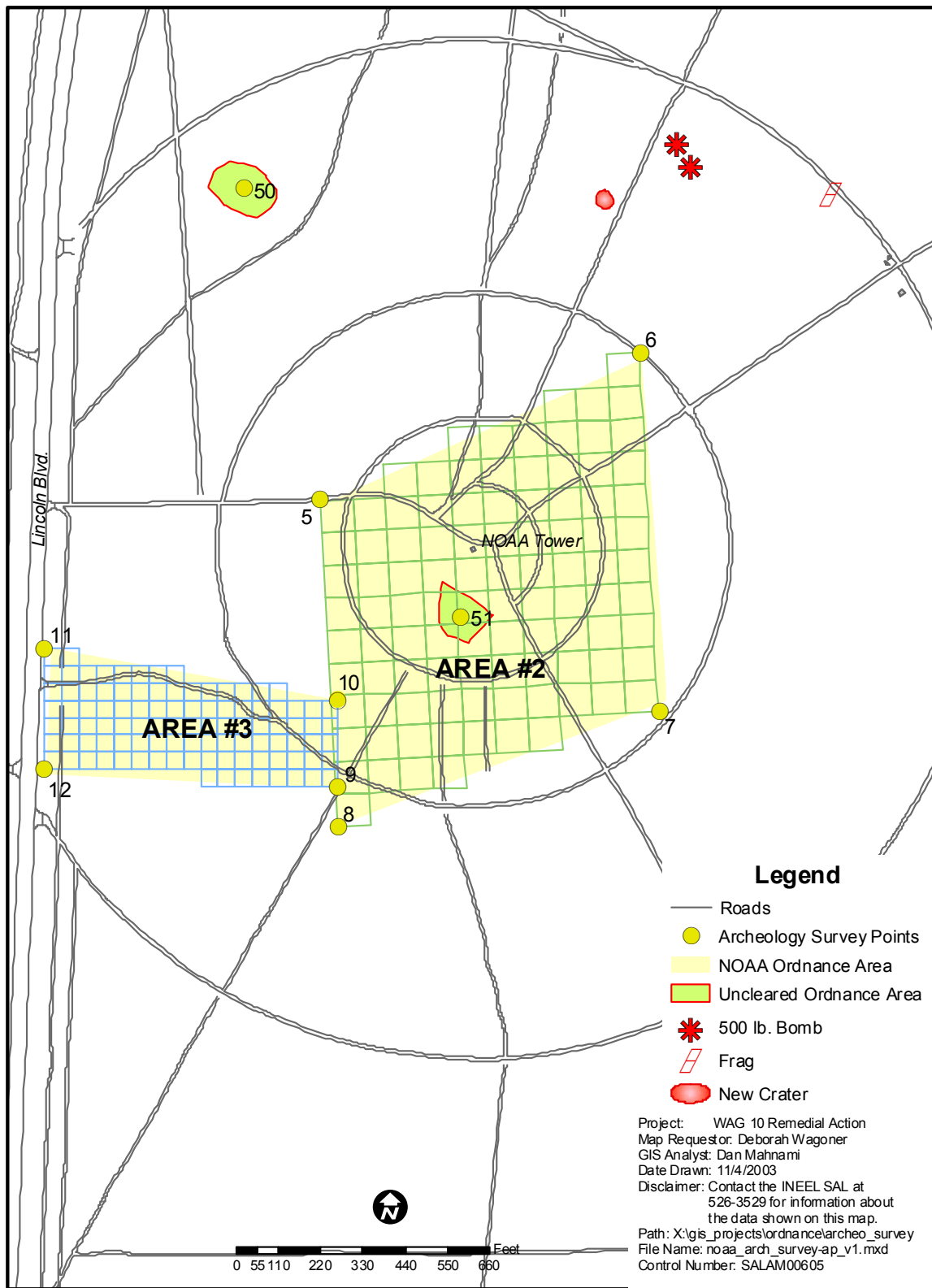


Figure 3-4. Location of the National Oceanic and Atmospheric Administration grid.

In 1999, surface soil samples were collected as described in the *Field Sampling Plan for Operable Unit 10-04 Explosive Compounds* (DOE-ID 1999). The results of this sampling effort were evaluated in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001). Contaminants were detected between 0 to 0.61 m (0 to 2 ft) below the ground surface; however, the highest detected concentrations were mainly located in the top 15 cm (0.5 ft) of the surface soil. The maximum detected 1,3-dinitrobenzene concentration was 27 mg/kg with maximum detected concentrations for RDX and TNT of 53 mg/kg and 17,014 mg/kg, respectively. Unexploded ordnance was removed during the 1993 and 1997 removal activities; however, there is still potential for some UXO to remain in the area.

The human health risk assessment identified TNT as a contaminant of concern for all study areas, based on human health risk estimates. The exposure pathways of concern are ingestion of soil, groundwater, and homegrown produce. The total risk for all pathways for the current occupational scenario is less than 1E-04 with a noncarcinogenic hazard index less than 1.0. The total estimated risk for all pathways for the 100-year future residential scenario is 4E-04 with a noncarcinogenic hazard index of 40. The total estimated risk for all pathways for the 100-year future occupational scenario is less than 1E-04 with a noncarcinogenic hazard index less than 1.0. The ecological risk assessment identified 1,3-dinitrobenzene (Study Area 6), RDX (Study Area 3), and TNT (Study Areas 2a, 3, 5, and 6) as contaminants of concern for ecological receptors. The HQs for exposure to 1,3-dinitrobenzene in the surface and subsurface soil ranged from 1 for the mule deer to a maximum of 200 for the pygmy rabbit. The deer mouse also has HQs exceeding 1.0. The HQs for exposure to RDX in the surface and subsurface soil ranged from 1 for the mule deer to a maximum of 20 for the pygmy rabbit with the deer mouse also having HQs exceeding 1.0. The HQs for exposure to TNT in the surface and subsurface soil ranged from 4 for the mule deer to a maximum of 500 for the pygmy rabbit with the deer mouse also having HQs exceeding 1.0. The pygmy rabbit is classified as a species of special concern by the State of Idaho.

3.2.5 Naval Ordnance Disposal Area

The location of the NODA is shown in Figure 3-5. During the 1994 removal action, 11.7 ha (28.92 acres) was cleared of ordnance and pieces of explosives to a depth of 1.2 m (4 ft). An additional 1.6 ha (3.89 acres) was cleared to a depth of 1.2 m (4 ft) from Lincoln Boulevard to the NODA to accommodate an access road. Because of the lack of information pertaining to tests performed in the pits at the NODA site, none of the pits were addressed during this action. The removal action was continued during the summer of 1995, when an additional 9.1 ha (22.56 acres) was cleared to a depth of 0.61 m (2 ft). The depth was reduced to 0.61 m (2 ft) from 1.2 m (4 ft), based on the results of the 1994 removal action. At this time, five pits were remediated. Two pits were remediated with a remote excavator, two pits were remediated with a backhoe, and one pit was hand excavated. The pits were excavated until the geophysical search revealed that no additional anomalies were identified (DOE-ID 1998).

During the 1996 field assessment, it was noted that the area outside the site was cleared during the 1994 and 1995 removal actions and was searched by field crews on foot using approximately 10-m (33-ft) intervals beginning at the west boundary. This search was continued outward until the last piece of fragmentation was found. All four sides of the original removal action site were assessed with multiple types of UXO recovered. Seven live 12.7-cm (5-in.) projectiles and one split-open 12.7-cm (5-in.) projectile with a live fuze were found. Scattered TNT and RDX were found on the south side and southeast corner of the area. What appears to have been a munitions burn facility (i.e., crumbled concrete box) was found just west of the Big Lost River. No ordnance or ordnance waste was found at this site; however, what appears to have been fuel-stained soil was observed on the berm on which this facility was constructed (DOE-ID 1998). Although UXO has been previously detected and cleared from this site, clearance cannot be considered complete for unrestricted land use.

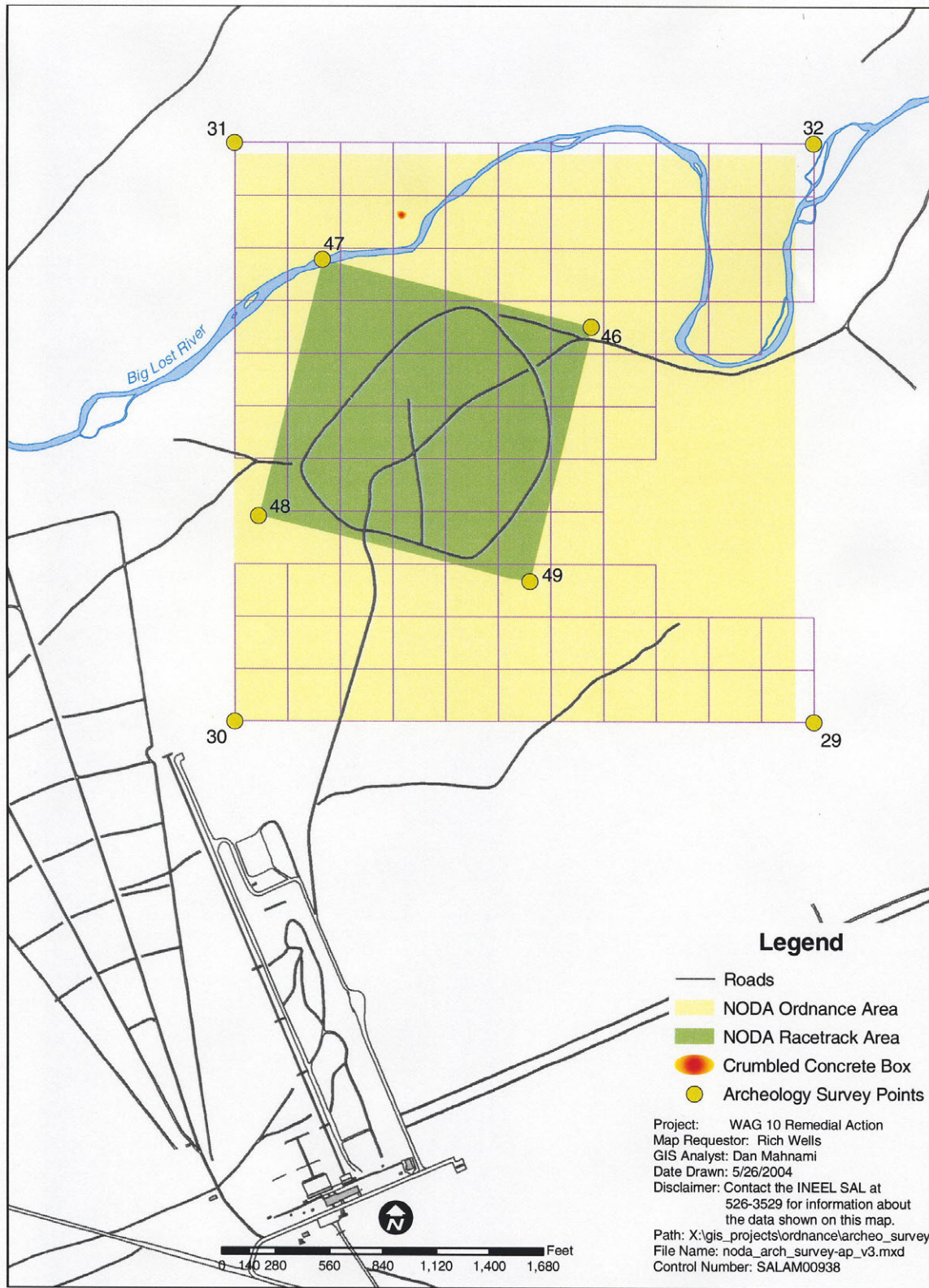


Figure 3-5. Location of the Naval Ordnance Disposal Area.

In 1999, surface soil samples were collected as described in the *Field Sampling Plan for Operable Unit 10-04 Explosive Compounds* (DOE-ID 1999). The results of this sampling effort were evaluated in the OU 10-04 Comprehensive RI/FS (DOE-ID 2001). Contaminants were detected between 0 to 0.61 m (0 to 2 ft) below the ground surface; however, the highest detected concentrations were mainly located in the top 15 cm (0.5 ft) of the surface soil. The maximum detected RDX concentration was 328 mg/kg. Based on the sampling results, only 2 acres of the 138-acre site pose a risk to human health and ecological receptors. Unexploded ordnance removal activities were conducted in 1994, 1995, and 1997 at the site; however, there is still some potential for UXO remaining in the area.

The human health risk assessment identified RDX as a contaminant of concern for Area 2, based on human health risk estimates. The exposure pathways of concern are ingestion of groundwater and homegrown produce. The total risk for all pathways for the current occupational scenario is less than 1E-04 with a noncarcinogenic hazard index less than 1.0. The total estimated risk for all pathways for the 100-year future residential scenario is 1E-02 with a noncarcinogenic hazard index of 100. The total estimated risk for all pathways for the 100-year future occupational scenario is less than 1E-04 with a noncarcinogenic hazard index less than 1.0. The ecological risk assessment identified RDX as a contaminant of concern for Area 2 for ecological receptors. The HQs for exposure to RDX in the surface and subsurface soil ranged from 3 for the Townsend's western big-eared bat to a maximum of 4,000 for the pygmy rabbit. The mule deer and the deer mouse also have HQs exceeding 1.0. The pygmy rabbit is classified as a species of special concern by the State of Idaho.

3.3 Site Preparation

Plot plans delineating the lay-down areas will be prepared before field activities commence. The following general site-preparation activities apply to all contaminated soil sites addressed in this RD/RA Work Plan. Any special requirements are provided in the technical specifications included in Attachment 1, "Construction Specification." A summary of planned activities for each site is provided in Section 5.5.

- Site walk-downs will be performed to locate any visible fragments of explosives
- The method for hauling contaminated soil will be demonstrated with clean soil and approved by the Contractor
- Excavation boundaries will be established in accordance with the design specifications
- Decontamination and lay-down areas will be established as directed by the Contractor.

3.4 Earthwork

All earthwork involving excavation and backfill will be graded following backfill (not all areas will require backfill) to encourage drainage away from the excavation. Those areas that are disturbed by earthwork activities will be revegetated. Standard dust-control measures (e.g., water spray, stop work during high winds, and soil fixatives) will be employed during all earthwork.

3.5 Surface Water

Contouring and grading backfilled areas will be performed to maintain existing surface water flow patterns at each of the task sites. To note, not all excavations will require backfilling, but areas will be

contoured for drainage and revegetated or otherwise stabilized. Revegetation of the backfilled excavations will be performed to control the growth of noxious weeds.

3.6 Task-Site Staging

A lay-down area will be necessary at each task site to stage equipment and materials close to the work. The staging areas will be located so that noncontaminated materials and equipment operate in work areas isolated from contaminated materials and equipment. A temporary decontamination area for personnel and equipment will be established at the control point for each area, in accordance with the decontamination requirements of the *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004). Spill prevention and control will be maintained for the lay-down areas. The lay-down areas will be selected based upon several factors. Meteorological data will be considered to ensure that the lay-down areas are not located in an area downwind from the prevalent wind direction at a task site. Included among the other considerations for selecting the lay-down areas at the task sites will be the proximity to the areas believed to require the greatest amount of excavation work, selection of clean areas based upon health and safety considerations, available infrastructure (i.e., power), and the topography of the site (e.g., undulating vs. flat). The combination of criteria will form the basis for selecting staging areas. Following the completion of all field activities, the task-site staging areas will be reclaimed in accordance with the specifications for contouring and revegetation.

4. HUMAN HEALTH AND ENVIRONMENTAL COMPLIANCE

4.1 Remedial Action Objectives

The RAOs for the TNT/RDX contaminated sites were developed in accordance with the “National Oil and Hazardous Substances Pollution Contingency Plan” (40 CFR 300) and EPA guidance (EPA 1988) and through the consensus of DOE-ID, EPA, and DEQ participants. The RAOs are based on the results of both the human health risk assessments and the ecological risk assessments and are specific to the contaminants of concern and exposure pathways developed for OU 10-04.

The conclusions from the remedial investigation/baseline risk assessment that were used to develop the RAOs are summarized below:

- Ingestion of homegrown produce, dermal adsorption of soil, ingestion of soil, and ingestion of groundwater are the only human health exposure routes with unacceptable estimated risks for the TNT/RDX soil sites.
- Risks associated with the air pathway are well below 1E-04; therefore, RAOs for the air pathway are not required. (Note: Appropriate safety measures, as determined by air emissions calculations, will be implemented during remedial actions to ensure that dust emissions do not exceed the limits specified by ARARs.)

The RAOs specified for protecting human health are expressed both in terms of risk and exposure pathways, because protection can be achieved through reducing contaminant levels as well as through restricting or eliminating exposure pathways. The overall intent of the human health RAOs is to limit the cumulative carcinogenic human health risk to less than or equal to 1E-04 and noncarcinogenic exposure to less than or equal to an HQ of 1. The RAOs specified for protecting ecological receptors inhibit adverse effects from contaminated soil on resident populations of flora and fauna. The RAOs developed to protect human health and ecological receptors are as follows:

- Inhibit dermal exposure to and ingestion of contaminated soil and food crops with a total excess cancer risk level of greater than 1E-04 and noncarcinogenic contaminants of concern with HQs greater than 1 for current and future workers and future residents.
- Prevent contamination of groundwater.
- Inhibit ecological receptor exposures to soil contaminated with contaminants of concern, primarily exposure to soil concentrations that result in an HQ greater than or equal to 10.0. The RAO excludes naturally occurring elements and compounds that are not attributable to historic releases.
- Inhibit any inadvertent contact with potential UXO by onsite workers and members of the public, since potential UXO exists at these areas.

Remediation goals were established to meet these objectives. The remediation goals for the TNT/RDX contaminated sites and the estimated volumes are provided in Table 4-1. These goals are at the upper end of the acceptable risk range because of the conservatism used in the risk assessment methods used to develop these values. By cleaning up to the identified contaminant concentration, remediation goals can be satisfied. Removing the principal threat waste types—TNT and RDX—will be protective, because surface exposure will be reduced or eliminated and will reduce the potential groundwater risk.

Table 4-1. Remediation goals and soil volumes for Operable Unit 10-04 Phase II contaminated soil sites.

Site	Contaminant of Concern	Exposure Point Concentration (mg/kg)	Remediation Goal ^a (mg/kg)	Contaminated Soil Volume (m ³ [yd ³])
Fire Station II Zone and Range Fire Burn Area	TNT	130 (maximum)	16.0	76.5 (100)
	RDX	3.7 (maximum)	4.4	
Experimental Field Station	TNT	1,100 (maximum)	16.0	76.5 (100)
	1,3-Dinitrobenzene	14 (maximum)	6.1	
Land Mine Fuze Burn Area	TNT	69,000 (maximum)	16.0	153 (200) ^b
National Oceanic and Atmospheric Administration	TNT	1,900 (95% UCL)	16.0	268 (350)
	RDX	1.78 (95% UCL)	4.4	
	1,3-Dinitrobenzene	27 (maximum)	6.1	
Naval Ordnance Disposal Area	RDX	328 (maximum)	4.4	38 (50)

a. The EPA Region 9 (2001) human health preliminary remediation goals were selected as the soil concentration remediation goals for all sites, because these values are protective of both human health and ecological receptors. The remediation goals are based upon the residential soil direct-contact exposure pathway concentrations. The EPA soil screening-level guidance for ecological receptors fell below the Region 9 preliminary remediation goal for all contaminants.

b. The actual volume at the Land Mine Fuze Burn Area may be considerably less (i.e., 7.6 m³ [10 yd³]), based upon recent visual observations.

EPA = U.S. Environmental Protection Agency

RDX = Royal Demolition Explosive

TNT = trinitrotoluene

UCL = upper confidence limit

4.2 Applicable or Relevant and Appropriate Requirements

Table 4-2 summarizes how the substantive requirements of the ARARs and the to-be-considered requirements for the OU 10-04 Phase II contaminated soil sites have been addressed by the remedial design or will be addressed during the remedial action. The substantive requirements of the RCRA and IDAPA ARARs specific to hazardous waste will be met for those sites where RCRA-hazardous constituents may be present. These requirements are not applicable to those sites where the soil is not RCRA hazardous. Use of air monitoring and dust-suppression techniques during excavation will ensure compliance with emission ARARs. The sites have been surveyed for cultural and archaeological resources (see Appendix A), and appropriate actions will be taken to satisfy ARARs for protection of sensitive resources. If cultural resources are encountered, the requirements delineated in the *INEEL Management Plan for Cultural Resources* (DOE-ID 2000) will be invoked. The DOD Standard 6055.9 Chapter 12 requirements (DOD 1997) also will be met.

Table 4-2. Compliance with applicable or relevant and appropriate requirements and to-be-considered guidance for trinitrotoluene/Royal Demolition Explosive contaminated soil sites.

Category	Citation	Reason	Relevancy ^a	Compliance Strategy
<i>Chemical-Specific ARARs</i>				
Idaho Ground Water Quality Rule	“Ground Water Quality Standards,” IDAPA 58.01.11.200	The TNT/RDX leaching from the site must not adversely affect groundwater quality. Standards for groundwater quality must be met.	A	Remediation of contaminated sites will be performed in accordance with the requirements set forth in this RD/RA Work Plan. Monitoring of groundwater quality at the INEEL has historically been performed under the purview of OU 10-08 with no analytes of concern detected. Groundwater monitoring of wells in the vicinity of and downgradient from the TNT/RDX sites will continue under OU 10-08.
<i>Action-Specific ARARs</i>				
Rules for the Control of Air Pollution in Idaho	“Fugitive Dust,” IDAPA 58.01.01.650 and .651	Requires control of dust at all times, especially during excavation of the soil.	A	Dust-suppression measures will be implemented, as necessary, during the remedial action to minimize the generation of fugitive dust. These measures may include water sprays, use of tarps, keeping vehicle speeds to a minimum, use of soil fixatives, and work controls during periods of high wind.
Resource Conservation and Recovery Act – Standards Applicable to Generators of Hazardous Waste	“Hazardous Waste Determination,” IDAPA 58.01.05.006 (40 CFR 262.11)	A RCRA hazardous waste determination is required for the TNT/RDX fragments, any recovered UXO, excavated soil, and other secondary waste generated during remediation that is to be treated or disposed of on or off the INEEL.	A	A hazardous waste determination will be developed based on an evaluation of sampling data and process knowledge to determine disposition of the waste.

Table 4-2. (continued).

Category	Citation	Reason	Relevancy ^a	Compliance Strategy
Resource Conservation and Recovery Act – Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Units	“General Facility Standards for Owners and Operators of Remediation Waste Management Sites,” IDAPA 58.01.05.008 (40 CFR 264.111[1–13])	General RCRA treatment, storage, and disposal facility standards must be met during remediation.	A	Analysis of waste will be performed in accordance with RCRA requirements. The INEEL site controls will prevent unauthorized access. Sites will be routinely inspected during management self-assessments. Training will be conducted in accordance with the project HASP (ICP 2004).
	“Equipment Decontamination,” IDAPA 58.01.05.008 (40 CFR 264.114)	All equipment used during remediation that contacts hazardous waste must be decontaminated in accordance with the substantive RCRA requirements.		Equipment decontamination will be conducted in accordance with the project HASP (ICP 2004), waste management procedures outlined in this RD/RA Work Plan (Appendix C), and the INEEL “Pollution Prevention Program” (PDD-1029).
	“Use and Management of Containers,” IDAPA 58.01.05.008 (40 CFR 264.171–177)	Hazardous waste generated during remediation that is managed in containers must meet the substantive RCRA requirements.		The waste management procedures outlined in this RD/RA Work Plan (Appendix C) ensure that waste is compatible with the container and container integrity is maintained. Weekly inspections will be conducted by Waste Generator Services. Secondary containment for all containers with free liquids will be provided at the CERCLA storage area. For all other containers, a storage area will be graded to provide run-off away from the containers.
	“Open Burning; Waste Explosives,” IDAPA 58.01.05.008 (40 CFR 265.382)	Detonation of TNT/RDX fragments and UXO must be performed in a manner that does not threaten human health or the environment.		Detonation of TNT/RDX fragments and UXO will be performed in accordance with approved procedures. Job safety analyses will be prepared, reviewed, and approved by subject-matter experts. Detonations will be performed by explosive ordnance disposal experts.

Table 4-2. (continued).

Category	Citation	Reason	Relevancy ^a	Compliance Strategy
Resource Conservation and Recovery Act – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities	“Military Munitions Rule,” 40 CFR 266.205 and .206	The TNT/RDX fragments and UXO identified as hazardous waste under RCRA must meet the substantive RCRA requirements for storage, if required during remediation on an interim basis, and transport. Any emergency response conducted during remediation involving munitions or explosives will be exempt from RCRA waste generator and transporter requirements.	A	The TNT/RDX fragments and UXO identified as hazardous waste under RCRA will be handled and stored in accordance with applicable hazardous waste requirements and established INEEL procedures. In accordance with 40 CFR 266.202(a), a military munition is not a solid waste when (1) used for its intended purpose including: (iii) Recovery, collection, and on-range destruction of unexploded ordnance and munition fragments during range clearance activities at active or inactive ranges. Therefore, it is anticipated that the majority of UXO will not be considered hazardous waste under RCRA.
<i>Location-Specific ARARs</i>				
National Historic Preservation Act	“Historic Properties Owned or Controlled by Federal Agencies,” 16 USC 470 h-2 “Identifying Historic Properties,” 36 CFR 800.4 “Assessment of Adverse Effects,” 36 CFR 800.5	In accordance with federal requirements, the site must be surveyed for cultural and archaeological resources before construction, and appropriate actions must be taken to protect any sensitive resources.	A	Cultural and archaeological resource surveys have been performed. A summary of the results of the surveys is provided in Appendix A. The surveys show that there are cultural and/or archaeological resources within the sites. Employees involved in remediation activities at the sites will be trained in archaeological awareness. When cultural and/or archaeological resources are encountered, measures will be taken to mitigate the effect that the remediation activities have on those resources.

Table 4-2. (continued).

Category	Citation	Reason	Relevancy ^a	Compliance Strategy
Native American Graves Protection and Repatriation Act	“Custody,” 25 USC 3002 (43 CFR 10.6) “Repatriation,” 25 USC 3005 (43 CFR 10.10)	In accordance with federal requirements, the site must be surveyed for cultural and archaeological resources before construction, and appropriate actions must be taken to protect any sensitive resources.	A	Cultural and archaeological resource surveys have been performed. A summary of the results of the surveys is provided in Appendix A. The surveys show that there are cultural and/or archaeological resources within the sites. Employees involved in remediation activities at the sites will be trained in archaeological awareness. When cultural and/or archaeological resources are encountered, measures will be taken to mitigate the effect that the remediation activities have on those resources.
<i>To-Be-Considered Guidance</i>				
“Real Property Contaminated with Munitions, Explosives, or Chemical Agents”	DOD Standard 6055.9, Chapter 12	Establishes requirements for disposition of real property known or suspected to be contaminated with ammunition, explosives, or chemical agents.		Remediation of contaminated sites will be performed in accordance with the requirements set forth in this RD/RA Work Plan. Land-use restrictions will be implemented and institutional controls maintained until remediation is completed and residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. The DOE-ID will notify the EPA and State of Idaho before any transfer, sale, or lease to a non-federal entity (such as a state or local government or a private person) of any DOE-ID managed real property that is the subject of institutional controls required by the ROD or other decision document and will discuss with EPA and the State of Idaho appropriate provisions in the conveyance or lease documents to maintain effective institutional controls.

Table 4-2. (continued).

Category	Citation	Reason	Relevancy ^a	Compliance Strategy
<p>a. A = applicable. b. To-be-considered items are not classified as applicable or relevant and appropriate. ARAR = applicable or relevant and appropriate requirement CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act CFR = <i>Code of Federal Regulations</i> DOD = U.S. Department of Defense DOE-ID = U.S. Department of Energy Idaho Operations Office EPA = U.S. Environmental Protection Agency HASP = health and safety plan IDAPA = Idaho Administrative Procedures Act INEEL = Idaho National Engineering and Environmental Laboratory OU = operable unit PDD = program description document RCRA = Resource Conservation and Recovery Act RD/RA = remedial design/remedial action RDX = Royal Demolition Explosive ROD = Record of Decision TNT = trinitrotoluene UXO = unexploded ordnance</p>				

4.3 Groundwater Monitoring

In accordance with the *Operable Units 6-05 and 10-04, Experimental Breeder Reactor-I/Boiling Water Reactor Experiment Area and Miscellaneous Sites, Remedial Design/Remedial Action Scope of Work* (DOE-ID 2003), various groundwater monitoring wells located downgradient from the TNT/RDX contaminated soil sites were sampled for TNT; RDX; 2,4-dinitrotoluene; 2,6-dinitrotoluene; and the degradation products 1,3,5-trinitrobenzene and 4-amino-2,6-dinitrotoluene. Groundwater monitoring is performed under the purview of OU 10-08; the results from this sampling effort were presented in *Waste Area Group 10, Operable Unit 10-08, Remedial Investigation/Feasibility Study Annual Report for Fiscal Year 2003* (DOE-ID 2004f). Verbal agreement was reached with the Agencies that further sampling of these wells for nitroaromatics was not warranted. An updated groundwater monitoring plan for OU 10-08 that reflects these changes will be provided to the Agencies for review in Fiscal Year (FY) 2005.

5. REMEDIAL ACTION WORK PLAN

The work plan details the management approach to the remedial action, including schedule and the necessary steps and documentation to perform the remedial action and document its completion. This section describes the elements necessary to implement the remedial design outlined in Sections 1–4. Because the remedial design and the remedial action work plan are combined into one document, some details of implementation have been described in the design portion of the document for clarity.

5.1 Relevant Changes to the Scope of Work

Defining the remediation boundaries at the various sites is an iterative process. The actual boundaries will be determined during the individual site walk-downs that will occur as the first step in the remedial action. As more visual data are collected, these boundaries will be better defined. The actual remediation boundaries will be reflected in the “as-built” drawings provided in the remedial action report, which will be prepared following the completion of the remedial action.

5.2 Design Assumptions

The assumptions under which the RD/RA activities will be performed for the remediation of the TNT/RDX contaminated soil sites are as follows:

- Archaeological concerns will be identified before implementation of the remedial action and will not delay planned activities
- Compatible waste storage capacity will be available during the TNT/RDX remediation activities to ensure that potentially reactive materials are segregated
- The contaminated soil will be disposed of at the INEEL CERCLA Disposal Facility (ICDF) with the exception of soil that exceeds 10,000-mg/kg concentrations for the summed concentrations of the analytes detected by SW-846 Method 8330 (EPA 2002) and will require transport to a RCRA treatment, storage, and disposal facility for thermal treatment and disposal
- Ecological risks will be reduced by the remedial actions implemented to reduce the human health risks for the sites presenting both types of risks
- Remediation goals based on hazard quotients of 10 or soil concentrations of 10 times background values are protective of ecological receptors
- The explosive-contaminated soil will not be determined to be RCRA hazardous based upon laboratory analyses performed during remediation
- Field screening for TNT or RDX will be indicative of the presence or absence of 1,3-dinitrobenzene
- The use of hand-held magnetometers will be adequate to identify any UXO lying below the surface at those sites requiring a UXO survey prior to excavation.

5.3 Unresolved Issues

Issues that have not been resolved include the following:

- The ICDF will be available to accept explosive-contaminated soil from OU 10-04 during the prescribed remediation period. Currently, the ICDF waste acceptance criteria are restrictive in terms of allowable concentrations for TNT and RDX contaminated soil, but the allowable maximum mass for the landfill should not preclude disposal of soil contaminated with either of these two analytes. However, the waste acceptance criteria will need to be revised to allow for the disposal of soil contaminated with 1,3-dinitrobenzene.
- Excavation of contaminated soil may be performed either by manual or mechanical excavation techniques depending on the actual volume of contaminated soil encountered.

5.4 Work Tasks

For the purposes of this RD/RA Work Plan, “Contractor” refers to BBWI. “Subcontractor” means the business entity contracted to provide the materials, supplies, and/or services discussed herein. The following sections summarize the primary work tasks critical to completion of the activities specified in this RD/RA Work Plan.

5.4.1 Premobilization

The BBWI Construction Management personnel assigned to this project will provide all required work orders. All Contractor and Subcontractor-required training and current medical examinations and information required by the *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004) will be provided prior to mobilizing to the task site.

5.4.2 Mobilization

Mobilization describes the tasks that must be performed in preparation for field operations. These tasks are generally the required administrative, engineering, and health and safety controls that must be implemented prior to the commencement of field activities and include, but are not limited to, the following:

- Emplacing required fences, signs, and postings
- Identifying and demarking task sites
- Delivering and storing required material and equipment
- Setting up the site offices for field operations (as required)
- Establishing the required lay-down areas
- Establishing the required decontamination areas.

5.4.3 Recovery and Disposal of Trinitrotoluene/Royal Demolition Explosive Fragments

Recovery of TNT/RDX fragments, as well as any UXO that is encountered during remediation of the TNT and RDX contaminated sites that poses an imminent hazard to personnel, will be under the

direction of a senior explosives ordnance disposal officer. The recovery and transportation of fragments will be performed using currently accepted practices and INEEL-specific standard operating procedures. All personnel participating in the recovery, transport, and disposal of TNT/RDX fragments and UXO will comply with the applicable health and safety requirements outlined in the *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004).

Every ordnance and explosive item to be investigated will be identified in terms of its type, size, and condition. The ordnance and explosive items will be fully characterized using applicable technical manuals (including U.S. Department of Defense Joint Services Technical Manual-60 Series documents) and, if necessary, active explosives ordnance disposal (EOD) units and other EOD resources to identify the type, sensitivities, and hazards of ordnance and explosives. The EOD-qualified health and safety officer and explosive experts will evaluate the condition of the ordnance and explosives, particularly the type and condition of the fuse. The fuse/alarm status will be established to determine the hazard. If the fuse condition cannot be determined or is questionable, the fuse condition will be considered armed.

For low-hazard ordnance and explosives, an exclusion zone will be established and maintained until remediation is completed in Phase II (for explosives) or Phase IV (for ordnance). This includes marking the ordnance and explosives, determining the distance of the exclusion zone based on the estimated weight of ordnance and explosives, posting signs, and establishing a tape barrier (if deemed necessary) around the perimeter of the exclusion zone.

Ordnance and explosives determined to be a high hazard will be removed if safe to handle, transported to the MDA, and destroyed by high-order detonation using additional explosives to initiate the detonation. If the HSO determines that the items cannot be safely transported, the items will be detonated in place after the proper documents are prepared and approved. Alternatively, the ordnance and explosives will be isolated by establishing a signed and fenced or barricaded exclusion zone. Fencing may be considered for use in areas where live UXO is present, immediate access or near-term removal cannot be performed, and where public and/or worker access to UXO could result in unintentional detonation. Fencing could be barbed wire, chain link, or both.

Given that high-order detonation will be used to dispose of all UXO and explosives during the Phase II activities, the quantity of explosive residues remaining at the site will be minimal. The potential contaminants of concern resulting from incomplete combustion at the MDA will be assessed following remediation of the UXO sites and prior to cleanup of the MDA. The MDA will remain under institutional control until remediation is performed following completion of the UXO remediation activities as part of the Phase IV cleanup.

5.4.4 Geophysical Investigation

Following the recovery and disposal of TNT/RDX fragments found on the surface, a geophysical survey will be conducted over the area to identify potential UXO lying under the surface. Anomalies detected from the surveys will be noted and further investigated prior to any intrusive removal of contaminated soil to determine whether suspect items are present that might require removal before soil excavation.

Three different technologies are available for the detection of UXO, depending on whether ferrous or nonferrous buried munitions are being sought. Magnetometers are frequently used when ferrous targets (e.g., bombs and artillery projectiles) might be present. When nonferrous targets (e.g., rockets, submunitions, and landmines) are the objects of interest, conductivity meters may be used. As a final method, ground-penetrating radar can be used to detect areas that might contain UXO.

For the geophysical investigations performed in support of the TNT/RDX remedial action, a handheld magnetometer will be used to determine whether any UXO is present at a site prior to excavation. Using a Schonstedt Magnetic Location Model #GA-52CX (or equivalent), an EOD-certified HSO will sweep the area to locate any metal, which could indicate the presence of UXO. If a positive identification is received using the instrument, the metal will be exposed via hand excavation and identified as to whether it is a metal fragment or ordnance. If it is ordnance, it will be disposed of in accordance with standard procedures.

5.4.5 Clearing the Site

The task sites will be cleared of shrubs, vegetation, fences, and other debris in accordance with Specification 02200–Earthwork, which is provided in Attachment 1 of this document. Because of the potential uptake of contamination, the vegetation will be collected along with the excavated soil for disposal in the ICDF.

Clearing operations will be confined to the soil sites to be remediated, limited to only those areas requiring excavation, those areas required for barrier construction (required as needed to establish the task-site work zones in accordance with the project health and safety plan), or as directed by INEEL project personnel. Any areas outside the designated areas that are damaged or disturbed by field operations will be repaired and reseeded by the Subcontractor in accordance with Section 02486–Revegetation, which is provided in Attachment 1 of this document.

5.4.6 Soil Excavation and Consolidation

Soil excavation will be limited to only that soil necessary to remediate each task site. Excavated soil will be consolidated, as necessary, in a designated area immediately adjacent to the task site. All excavation and consolidation activities will be performed in accordance with Specification 02200—Earthwork, which is provided in Attachment 1 of this document. To minimize the spread of contamination, equipment necessary for soil excavation will remain within the contamination control zones until completion of excavation activities.

Precautions such as water spray, wind monitoring, soil fixatives, and visual observation will be used as needed to prevent the generation of fugitive dust. Air monitoring to assess the airborne spread of contamination will be performed in accordance with the *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004). Air monitoring will be conducted as needed to ensure that workers are protected from unnecessary exposure to chemical hazards. Personal protective equipment, when required, will be used as specified in the project health and safety plan and as determined by the industrial hygienist present at the task site.

5.4.7 Earthwork

The earthwork on this project will be defined as the following:

- Clearing vegetation as required (vegetation is minimal and clearing may be accomplished concurrently with the excavation of contaminated soil)
- Excavating all materials encountered, of every description, for completion of the project as described in Section 02200–Earthwork, which is provided in Attachment 1
- Managing dust control

- Delivering all contaminated material excavated for completion of the project to an on-Site disposal facility
- Backfilling or contouring all excavations and reclaiming all disturbed task area support sites
- Compacting all backfill in accordance with Section 02200—Earthwork, which is provided in Attachment 1
- Finishing grading and grading for surface draining or revegetation in accordance with Section 02200—Earthwork and Section 02486—Revegetation, which are provided in Attachment 1.

Earthwork at each of the task sites will include backfill with native soil from approved borrow sources on the INEEL (as required). All earthwork will be performed in accordance with Section 02200—Earthwork, which is provided in Attachment 1 of this document.

5.4.8 Borrow, Haul, and Stockpile

Borrow materials that are required for this project are available from borrow sources located at the INEEL. All on-Site borrow sources have been previously determined to be free of contamination. Borrow operations will be performed in accordance with Section 02200—Earthwork, which is provided in Attachment 1 of this document, and an approved INEEL Form 450.AP01, “INEEL Gravel/Borrow Source Request Form.” An operation will be established at the borrow area to gather and stockpile the material in preparation for a hauling operation to move the material from the borrow source to the project site for emplacement.

Equipment used for the haul and stockpile operations will remain outside the contamination work areas. The work will require the services of heavy earthwork equipment such as scrapers, dozers, loaders, and large dump trucks. The work also will require up-front planning and coordination with other site operations and personnel to ensure safe and productive hauling across Site roads. The project will be responsible for maintaining the Site haul roads during operations and for returning haul roads to their original condition. If necessary, a traffic management plan will be prepared, including documentation of the condition of the haul roads prior to operations.

5.4.9 Contaminated Soil Hauling

Contaminated soil will be hauled to the disposal facility in either end-dump trucks or roll-on/roll-off containers with an anticipated capacity of 9.2 m³ (12 yd³) or greater. It is anticipated that any soil generated will be transported in exclusive-use, closed-transport vehicles.

Hauling may occur concurrently from different locations, provided the buddy system remains in effect and the crew is large enough to support the operations, as determined by the field team leader, health and safety officer, and/or job-site supervisor. Each dump truck or roll-on/roll-off container will have a locking tailgate with a gasket or another mechanism to prevent loss of soil during transport. The driver will inspect the tailgate before and after loading to ensure that it is properly latched. The dump truck or roll-on/roll-off container will have a new plastic liner installed for each load to mitigate spread of contamination and provide a means of dust control during transportation and disposal. Loads will be covered with a tight-fitting tarp to prevent loss of material during transport. The cover will be evaluated and approved by environmental personnel before initial use and throughout the duration of the project.

After loading and before leaving the area, the driver will visually inspect each truck or roll-on/roll-off container to ensure that the exterior is not contaminated. Before leaving the area and under

the direction of the job site supervisor, any discovered external contamination will be removed. After the load has been dumped, the truck or roll-on/roll-off container will be covered with a tarp for the return trip.

5.4.10 Dust Suppression

Dust generation will be minimized during excavation, loading, hauling, and dumping by using water truck(s) and/or soil fixatives. Results of air monitoring, as required by the *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004), will help determine whether the dust-suppression methods are adequate. Over application of water, resulting in free liquids, will not be allowed because additional requirements would be imposed for handling liquid waste. A water-fill station is available at the CFA and fire hydrants are available at other facilities, provided an outage request is processed. Filling at a fire hydrant requires using an attaching gate valve and fire hose approved by the project manager and/or designee to ensure compatibility.

Work will be restricted or suspended if unacceptable amounts of dust are being generated as determined by the field team leader and/or health and safety officer. This dust could be a result of dry soil (which might require wetting) or a result of wind. All excavating, loading, hauling, and dumping operations will be suspended when sustained wind speed or gusts, as reported by the INEEL NOAA weather station, exceed established levels. Several partial or full days are anticipated to be lost because of high wind. Work areas that have the potential of generating dust will require water spraying at the end of each workday and other occasions as deemed necessary by the field team leader and/or health and safety officer.

5.4.11 Reclamation Seeding

Upon completion of all earthwork activities, reclamation seeding will take place on the lay-down areas and all areas affected by the remediation activities, including material borrowing and stockpiling. The seeding and mulching of these sites will be performed in accordance with the requirements delineated in Section 02486–Revegetation, which is provided in Attachment 1 to this document.

5.4.12 Demobilization

After the remedial action activities have been satisfactorily completed and all equipment has been properly decontaminated, task personnel will demobilize and the equipment will be removed from the site. Decontamination pads and temporary fencing erected in support of the activities described herein will be removed and packaged or disposed of appropriately.

5.5 Summary of Site Activities

The specifications provided in Attachment 1 outline the details of the work to be conducted in support of the OU 10-04 Phase II remedial action. Areas within individual sites will be spot-excavated to remove contaminated soil. The figures in Section 3 provide a general description of the larger sites. The actual contamination in a given site will be limited to small areas with visible fragments of TNT and RDX as well as visibly contaminated soil. These smaller areas will be identified during the individual site walk-downs. Following confirmation that the RAOs have been achieved for a given site, the site will be revegetated, as necessary. The following subsections summarize the field activities that will take place at each of the individual contaminated soil sites.

5.5.1 Fire Station II Zone and Range Fire Burn Area

The Fire Station II Zone and Range Fire Burn Area is approximately 0.13 km² (33 acres), but the area of contamination is fairly well defined and restricted to a 752-m² (900-yd²) area of scattered TNT fragments and explosives-stained soil. The estimated volume of soil to be remediated is 76.5 m³ (100 yd³). A survey for UXO will not be required, because it was not detected during the 1993 removal action or the 1996 field assessment.

To identify and flag (using conventional survey flags) all visible fragments of TNT and stained soil, the site will be visually surveyed on foot by field crews spaced approximately 1.5 m (5 ft) apart. The search will initially cover the area of contamination shown in Figure 3-1 and extend 6 m (20 ft) beyond the boundary line in all directions. If no TNT contamination is detected in the 6-m (20-ft) zone, no further walk-down will be performed. If contamination is discovered, the search will extend another 6 m (20 ft) beyond the boundary line. The search will continue in this fashion until no contamination is detected within the 6-m (20-ft) zone.

Once all TNT contamination is identified and flagged, the field team will retrieve the TNT fragments by hand and place them in containers. All stained soil will be excavated by hand or with a small excavator to an initial depth of approximately 7.5 cm (3 in.). The excavated soil will be placed in containers or stockpiled at a single location on the site. Appropriate dust-suppression techniques will be used to minimize the generation of fugitive dust and to mitigate exposure of personnel to any airborne contamination.

Using field screening methodology, the soil at the bottom of the excavations will be analyzed for TNT and RDX. If the results are below the remediation goal, no further excavation will be required. If the results exceed the remediation goal, another 7.5-cm (3-in.) lift (approximate) will be performed, followed by reanalysis of the remaining soil. This iterative process will continue until the contaminant concentrations in the remaining soil are below their respective remediation goals.

Sampling will be performed in accordance with the *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004a). Based on the results of the confirmatory sampling, additional excavation might be required. Once it is confirmed that the remediation goals have been achieved, the excavated areas will be contoured to match the surrounding terrain and revegetated, as necessary.

The collected explosive fragments will be transported to the MDA and disposed of by detonation. The excavated soil will be characterized, as necessary, to ensure compliance with the waste acceptance criteria for the selected disposal facility (e.g., the ICDF). If the summed concentrations of the analytes detected by SW-846 Method 8330 (EPA 2002) in the excavated soil exceed 10,000 mg/kg, the soil will be transported to a permitted RCRA treatment, storage, and disposal facility for thermal treatment and disposal.

5.5.2 Experimental Field Station

The Experimental Field Station is approximately 0.07 km² (17.7 acres), but the area of contamination is restricted to a single small area approximately 511 m² (611 yd²), as shown in Figure 3-2. The estimated volume of soil to be remediated is 76.5 m³ (100 yd³). Because the site was surveyed for UXO and cleared in 1997, a survey will not be required.

The area will be visually surveyed on foot as described above for the Fire Station II Zone and Range Fire Burn Area with the remediation following the same approach. The remaining soil will be tested for TNT using field screening methodology, assuming that the TNT will be indicative of the

presence or absence of 1,3-dinitrobenzene. The same iterative process of excavation followed by testing will be used as previously described. Sampling will be performed in accordance with the *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004a). Following confirmation that the remediation goals have been achieved, the excavated areas will be contoured to match the surrounding terrain and revegetated, as necessary.

The collected fragments of TNT will be transported to the MDA and disposed of by detonation. The excavated soil will be characterized, as necessary, to ensure compliance with the waste acceptance criteria for the selected disposal facility. If the summed concentrations of the analytes detected by SW-846 Method 8330 (EPA 2002) in the excavated soil exceed 10,000 mg/kg, the soil will be transported to a permitted RCRA treatment, storage, and disposal facility for thermal treatment and disposal.

5.5.3 Land Mine Fuze Burn Area

The Land Mine Fuze Burn Area is approximately 0.10 km² (27 acres), but the area of contamination is much smaller, as shown in Figure 3-3. According to the OU 10-04 ROD (DOE-ID 2002), the estimated volume of soil to be remediated is approximately 153 m³ (200 yd³); however, based upon recent visual observations at the site, the actual volume is anticipated to be much less (i.e., 7.6 m³ [10 yd³]). The area in the vicinity of the TNT contamination was surveyed and cleared for UXO in 1996; therefore, a survey will not be required prior to excavation.

An extended search for TNT fragments and stained soil is not required, because the site has been walked down several times with the contamination shown to be limited to a small area. The extent of contamination will be visually identified and marked. The TNT fragments will be retrieved by hand and placed in containers. Stained soil within the marked boundary will be excavated by hand or with a small excavator to an initial depth of approximately 7.5 cm (3 in.). The same iterative process of excavation followed by analysis will be followed, as described previously. Soil samples will be collected in accordance with the requirements delineated in the *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004a).

The collected fragments of TNT will be transported to the MDA and disposed of by detonation. The excavated soil will be characterized, as necessary, to ensure compliance with the waste acceptance criteria for the selected disposal facility. If the summed concentrations of the analytes detected by SW-846 Method 8330 (EPA 2002) in the excavated soil exceed 10,000 mg/kg, the soil will be transported to a permitted RCRA treatment, storage, and disposal facility for thermal treatment and disposal.

5.5.4 National Oceanic and Atmospheric Administration Site

The NOAA site is approximately 0.18 km² (46 acres). The TNT fragments and explosives-contaminated soil is widespread throughout this site and is known to extend beyond the areas previously sampled. The estimated volume of soil to be remediated is 268 m³ (350 yd³). A survey for UXO at this site will be required because of its widespread presence.

Field crews will conduct a visual survey of the entire NOAA site on foot, as previously described. Once all contamination has been identified and flagged, an EOD-trained individual will evaluate the areas requiring remediation and determine which areas will require a UXO survey. Any detected UXO will be removed prior to soil excavation.

Once the areas are determined to be clear of UXO, the site will be remediated, as previously described. Soil at the bottom of excavations will be tested for TNT and RDX using field screening methodology, assuming that the TNT and RDX will be indicative of the presence or absence of 1,3-dinitrobenzene. The same iterative process of excavation followed by testing will be used as

previously described. Sampling will be performed in accordance with the *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004a). Following confirmation that the remediation goals have been achieved, the excavated areas will be contoured to match the surrounding terrain and revegetated, as necessary.

The collected explosive fragments will be transported to the MDA and disposed of by detonation. The excavated soil will be characterized, as necessary, to ensure compliance with the waste acceptance criteria for the selected disposal facility (e.g., the ICDF). If the summed concentrations of the analytes detected by SW-846 Method 8330 (EPA 2002) in the excavated soil exceed 10,000 mg/kg, the soil will be transported to a permitted RCRA treatment, storage, and disposal facility for thermal treatment and disposal.

5.5.5 Naval Ordnance Disposal Area

The NODA is approximately 0.56 km² (138 acres), but the area of contamination is fairly well defined and believed to be limited to a single crater. No TNT fragments have been visually identified at this site. Contamination is limited to RDX fragments and visibly contaminated soil with an estimated remediation volume of 38 m³ (50 yd³). A survey for UXO will not be required, because it was not detected during previous surveys.

Field crews will delineate the boundary of the crater with the area to be remediated extending beyond this boundary approximately 1 m (3 ft) in all directions. The same iterative process of excavation followed by analysis will be followed, as described previously. Soil samples will be collected in accordance with the requirements delineated in the *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004a).

The collected fragments of RDX will be transported to the MDA and disposed of by detonation. The excavated soil will be characterized, as necessary, to ensure compliance with the waste acceptance criteria for the selected disposal facility. If the summed concentrations of the analytes detected by SW-846 Method 8330 (EPA 2002) in the excavated soil exceed 10,000 mg/kg, the soil will be transported to a permitted RCRA treatment, storage, and disposal facility for thermal treatment and disposal.

5.6 Field Oversight

The DOE-ID remediation project manager will be responsible for notifying the EPA and the DEQ about project activities. The project manager also will serve as the single interface point for all routine contact between the Agencies and the Contractor. In addition, the Contractor will provide support services for field oversight, health and safety, environmental, quality assurance, and landlord services for this project. An organization chart and position descriptions are provided in the *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004).

5.6.1 Protocol and Coordination of Field Oversight

The DOE-ID will notify the EPA and DEQ WAG managers of pending remedial action activities, such as project startup, closeout, and inspections. Activities related to preliminary inspections, the prefinal inspection, and the final inspection (if deemed necessary) will be provided to the EPA and DEQ WAG managers a minimum of 14 calendar days prior to commencement of the activity.

Visitors to any of the project sites who wish to observe activities must meet badging and training requirements necessary to enter INEEL facilities. Training requirements for visitors are described in the

5.7 Project Cost Estimate

The project cost estimates for the tasks addressed by the Phase II Work Plan are presented in Table 5-1. The costs may be revised during subsequent submittals of this document to reflect the most current estimate, based on comments to the design and other data.

Table 5-1. Phase II project cost estimate.

Description	Cost (\$) (Net Present Value)	Totals (\$)
Capital Costs		731,000
Remedial Design	278,000	
Remedial Design/Remedial Action Statement of Work	11,000	
Remedial Design/Remedial Action Work Plan	111,000	
Hazards and safety analysis documentation	23,000	
Sampling and Analysis Plan	20,000	
Operations and Maintenance Plan	20,000	
Health and Safety Plan	11,000	
Plans and specifications	29,000	
Waste Management Plan	20,000	
Miscellaneous environmental documentation	33,000	
Remediation Support	147,000	
Quality assurance	22,000	
Project office operations	125,000	
Remediation/Technical Support Activities	42,000	
Engineering and technical support	42,000	
Remedial Action	220,000	
Mobilization and preparatory work	6,000	
Site work	183,000	
Site restoration	8,000	
Demobilization	6,000	
Other	17,000	
Removal Action	44,000	
Remedial Action Report	44,000	
Operations Cost ^a		2,074,000
General and Administrative		6,000
SUBTOTAL COSTS		2,758,000
Plus 30% contingency		827,000
TOTAL PROJECT COST IN NET PRESENT VALUE		3,585,000

a. The operations cost reflected here is attributed to the operations and maintenance costs associated with the Phase I operations and maintenance activities.

Note: Net present value is the cumulative worth of all costs, as of the beginning of the first year of activities (i.e., FY 2003), accounting for inflation of future costs. Net present values are estimated assuming variable annual inflation factors for the first 10 years, in accordance with DOE Order 430.1B, "Real Property Asset Management," followed by a constant 5% annual inflation rate. A constant 5% discount rate is assumed.

DOE = U.S. Department of Energy

FY = fiscal year

5.8 Project Schedule

The schedule for Phase II of the OU 10-04 RD/RA is presented in Table 5-2. The schedule covers all Phase II project tasks identified in the OU 10-04 RD/RA Scope of Work (DOE-ID 2003) through completion of the Phase II remedial action report. Administrative and document preparation activities are based upon an 8-hour day, 5-day workweek, while field activities are based upon a 10-hour day, 4-day workweek. The schedule does not include any contingency for delay because of late or slow document reviews or for field activities experiencing loss of productivity because of adverse weather conditions or other causes outside the project team's control.

Table 5-2. Remedial action schedule.

Activity	Start Date	Completion Date	Enforceable Date
Draft RD/RA Scope of Work sent to Agencies for review	10/1/2002	11/10/2002	—
RD/RA Scope of Work finalized	11/10/2002	1/27/2003	—
Draft Phase II RD/RA Work Plan prepared	10/1/2003	3/30/2004	3/30/2004
Agency review of the Draft Phase II RD/RA Work Plan	3/31/2004	5/17/2004	—
Agency comments on Draft Phase II RD/RA Work Plan due	—	5/17/2004	—
Resolution of Draft Phase II RD/RA Work Plan comments	5/18/2004	7/2/2004	—
Draft Final Phase II RD/RA Work Plan sent to Agencies	7/6/2004	8/5/2004	—
Phase II RD/RA Work Plan finalized	—	8/19/2004	—
Phase II remedial action ^a	10/1/2007	8/26/2008	—
Phase II prefinal inspection	8/12/2008	8/26/2008	—
Prefinal Inspection Report for Phase II prepared	8/26/2008	9/9/2008	—
Prefinal Inspection Report for Phase II submitted to Agencies	—	9/10/2008	—
Draft Phase II Remedial Action Report prepared	9/11/2008	11/16/2008	—
Draft Phase II Remedial Action Report submitted to Agencies	—	11/17/2008	11/30/2015
Agency review of the Draft Phase II Remedial Action Report	11/18/2008	1/2/2009	—
Agency comments on the Draft Phase II Remedial Action Report due	—	1/2/2009	—
Resolution of Draft Phase II Remedial Action Report comments	1/3/2009	2/16/2009	—
Draft Final Phase II Remedial Action Report sent to Agencies	2/17/2009	3/19/2009	—
Phase II Remedial Action Report finalized	—	4/2/2009	—

a. An allowance will be made for shutdown of field activities during the winter months.
RD/RA = remedial design/remedial action

5.9 Inspections

Periodic inspections can occur at any time during the remediation activities. Before completion of remediation activities, a standard prefinal inspection will be performed at each site at the discretion of the project managers or designees. The prefinal inspection will be conducted to document the status of all project work elements. If determined to be necessary by concurrence of the Agencies, a final inspection may be performed to assess whether deficiencies identified during the prefinal inspection have been adequately addressed. The inspections will establish compliance with the RD/RA Work Plan and all requirements indicated.

5.9.1 Prefinal Inspection

The Agency project managers or their designees will conduct the prefinal inspection before completion of the remedial action. The DOE-ID will notify the Agencies approximately 2 weeks before the prefinal inspection date. This inspection will determine the status of the remediation activities, including outstanding requirements and actions necessary to resolve any issues identified. During the inspection, the Agencies will identify and approve all of the outstanding requirements along with the actions required to resolve them. The prefinal inspection report will document any unresolved items and the actions required for resolution. In some instances, the prefinal inspections can be performed as each major element of the project is completed, rather than at the time of total completion.

A checklist used to document the prefinal inspection will be developed and implemented upon approval by the Agencies. The action for resolution and the anticipated schedule of completion will be noted next to the outstanding items and documented on the prefinal inspection checklist.

5.9.2 Prefinal Inspection Report

Documentation of the prefinal inspection will be provided in a prefinal inspection report that will contain the following elements:

- The names of all inspection participants
- The inspection checklist(s) containing specific project elements and areas to be inspected to constitute acceptance of the remediation activities
- A discussion of all documented inspection findings
- Corrective actions to be taken to correct deficiencies identified in the inspections, including the required corrective action, acceptance criteria or standards, and planned dates for completion of the actions
- A date for the final inspection, if necessary.

The prefinal inspection report will be issued to indicate the objectives of the OU 10-04 ROD (DOE-ID 2002) are being met. The prefinal inspection report will not be revised/finalized. The inspection will be finalized in the remedial action report documenting the prefinal inspection process. The completed prefinal inspection checklist may be included as an appendix to the remedial action report in accordance with Section 8.4 of the *Federal Facility Agreement and Consent Order for the Idaho National Engineering Laboratory* (DOE-ID 1991). Submittal of the prefinal inspection report and the respective targeted schedule are identified in Section 5.8.

5.9.3 Final Inspection

If deemed necessary, the final inspection will be conducted following demobilization, after all excess materials and nonessential remediation equipment have been removed from the sites, and remediation of the sites is considered complete. Some equipment may remain onsite to repair items identified during final inspections. Final inspections, as conducted by the Agencies' project managers or their designees, will confirm the resolution of all outstanding items identified in the prefinal inspection and verify that the OU 10-04 Phase II remedial action has been completed in accordance with the requirements of the OU 10-04 ROD (DOE-ID 2002). Final inspections will be documented in the remedial action report.

5.10 Remedial Action Sampling and Analysis Plan

The Remedial Action Sampling and Analysis Plan for Phase II of the OU 10-04 RD/RA Project is comprised of two parts: the field sampling plan and the quality assurance project plan. These plans have been prepared pursuant to the "National Oil and Hazardous Substances Pollution Contingency Plan" (40 CFR 300), consistent with the EPA policy on the preparation of sampling and analysis plans, and in accordance with internal company procedures. The *Field Sampling Plan for the Operable Units 6-05 and 10-04 Remedial Action, Phase II* (DOE-ID 2004a) describes the field sampling activities that will be performed, while the Quality Assurance Project Plan details the process and programs that will be used to ensure that the data generated are suitable for their intended purposes. The governing quality assurance project plan for this sampling effort will be the *Quality Assurance Project Plan for Waste Area Groups 1, 2, 3, 4, 5, 6, 7, 10, and Deactivation, Decontamination, and Decommissioning* (DOE-ID 2004b), which is incorporated into the field sampling plan by reference. Work control processes will follow formal practices in accordance with communicated agreement with the appropriate site area directors and the Balance of INEEL Cleanup project manager.

5.11 Health and Safety Plan

A site-specific Health and Safety Plan (ICP 2004) has been prepared for the tasks and conditions to be encountered during this project. The Health and Safety Plan is a living document and may be updated as conditions dictate. The Health and Safety Plan covers the following items:

- Task-site responsibility
- Personnel training
- Occupational Medical Program and medical surveillance
- Accident Prevention Program
- Site control and security
- Hazard evaluation
- Personal protective equipment
- Decontamination
- Emergency response plan for the task sites.

5.12 Waste Minimization Plan

Waste will be generated as a result of the activities conducted during this project. The types of waste expected to be generated include, but are not limited to, the following:

- Personal protective equipment
- Equipment decontamination liquid residue
- Equipment decontamination solid residue
- Plastic sheeting
- Excavated, contaminated soil
- Explosive fragments (to be detonated on the INEEL)
- Removed vegetation to be disposed of with the excavated, contaminated soil
- Air monitoring filters
- Unused/unaltered sample material
- Analytical residues
- Sample containers
- Hydraulic spills
- Miscellaneous waste.

Waste could be hazardous. As remediation continues, additional waste streams could be identified. All waste streams are required to have the waste identified and characterized. The appropriate waste management organization (e.g., Waste Generator Services) will complete and approve hazardous waste determinations prior to or at the time of generation. A description of the types of waste anticipated to be generated and the proposed disposition route is provided in Appendix C, "Waste Management Plan."

5.13 Work within the Floodplain

Portions of the Experimental Field Station are within the hypothetical 100-year floodplain of the Big Lost River, as described in the *Flood Routing Analysis for a Failure of Mackay Dam* (EG&G 1986). The typical elevation of this area is 4,880 ft above mean sea level (msl) and the estimated peak water surface elevation in the area is approximately 4,883 ft msl. Therefore, the portions of the Experimental Field Station that are below 4,883 ft msl are subject to potential flooding due to flows from the hypothetical Big Lost River/Mackay Dam failure.

The NODA racetrack and ordnance areas near the Live Fire Test Range near CFA are immediately adjacent to the Big Lost River and are within the 100-year floodplain, as identified in Figure 6 of the *Flood Routing Analysis for a Failure of Mackay Dam* (EG&G 1986). The proposed actions at the NODA areas that occur below an elevation of 4,941 ft msl would be within the hypothetical 100-year floodplain.

Likewise, the maps for the NOAA Areas 2 and 3, the First Station II Zone and Range Fire Burn Area, and the Land Mine Fuze Burn Area show that all these areas are below 4,909 ft msl, which is the estimated peak water surface elevation in the areas. Therefore, these areas are considered to be within the floodplain of the Big Lost River.

Because of the nature of the remedial action (i.e., removal and disposal), the impacts from the remediation activities with respect to a 100-year flood event are minimal. The removal of contaminated material from the sites improves the areas and decreases the deleterious effects and potential environmental transport of contamination because of a 100-year flood.

5.14 Decontamination Plan

Equipment decontamination will be conducted at each task site where contaminated materials will be encountered. Decontamination areas will be established such that the potential for downwind contamination from the remediation sites is mitigated. Decontamination operations will be performed in accordance with the requirements set forth in the *Health and Safety Plan for the Waste Area Group 10 Remedial Action at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004).

Dry decontamination procedures will be used at the beginning of the decontamination effort. If these procedures are not successful, the equipment will be moved onto a clean decontamination pad or plastic and sprayed with a high-pressure water spray from a portable unit. All equipment will then be surveyed and visually inspected to ensure that all source contamination has been removed. If additional decontamination is required, further decontamination efforts will be conducted until the equipment is clean and may be released. The equipment will remain in the area where remediation is occurring until it is adequately decontaminated as verified by field surveillance methods.

Management of waste generated during decontamination efforts will remain within the area of contamination for temporary storage until final waste disposition. Tools used for equipment decontamination will be decontaminated, surveyed for contamination, and released for reuse.

5.15 Spill Prevention/Response Program

Any inadvertent spill or release of potentially hazardous materials will be subject to the substantive requirements contained in the “INEEL Emergency Plan/RCRA Contingency Plan” (PLN-114). Handling of the materials and/or substance will be performed in accordance with the recommendations of the applicable material safety data sheets, which will be located onsite. In the event of a spill, the emergency response plan (see Section 11 of the Health and Safety Plan [ICP 2004]) will be activated. All materials/substances on the work site will be stored in accordance with the applicable regulations and in approved containers.

5.16 Operations and Maintenance Plan

The *Operations and Maintenance Plan for Operable Units 6-05 and 10-04, Phase II* (DOE-ID 2004c) describes the long-term operations and maintenance activities that will be conducted in support of the OU 10-04 Phase II activities to ensure that the selected remedies identified in the OU 10-04 ROD (DOE-ID 2002) remain protective of human health and the environment. The plan outlines the ongoing maintenance activities and inspection requirements for the Phase II remediated areas. The plan is a living document, revised as necessary to incorporate changes and additions identified during the implementation of the plan. If contamination exceeds the allowable concentrations for free-release

remains following all efforts to remediate a site, the site will be placed under institutional control. This event will be documented in the final remedial action report.

The *INEEL Sitewide Institutional Controls Plan for CERCLA Response Actions* (DOE-ID 2004d) outlines the institutional control requirements for INEEL CERCLA sites, including WAG 10. Land use will be restricted at the five TNT/RDX contaminated soil sites until remediation is implemented as prescribed in the OU 10-04 ROD (DOE-ID 2002); then, based on analysis of residual risk, potential land use will be determined. Land-use control will not be required after remediation if all TNT/RDX fragments and contaminated soil above the remediation goal are removed and it can be confirmed that all UXO is removed. Remediation, however, may not be 100% effective, and buried, undetected TNT/RDX fragments may remain at the site. In addition, confirmation of complete UXO removal may not be possible in all locations, and complete UXO removal may not be practical or feasible in some areas. As determined by postremediation risk analysis, land-use restrictions will be established and maintained as required for areas that potentially pose a threat from buried, undetected TNT/RDX and/or UXO. Institutional controls will be maintained until residual risk is removed or reduced to acceptable levels based on the results of a 5-year review. The DOE-ID will notify EPA and the State of Idaho before any transfer, sale, or lease to a nonfederal entity (such as a state or local government or a private person) of any of the five sites. These sites will be subject to 5-year reviews with restrictions remaining until 2095 or until determined to be unnecessary during the 5-year reviews.

5.17 Remedial Action Report

The Phase II remedial action report will be prepared following demobilization and restoration of the sites and submitted to the Agencies as a primary document. The remedial action report will include, but not be limited to, the following:

- Identification of the work defined in the RD/RA Phase II Work Plan and certification that the work was performed.
- Explanation of any modifications to the RD/RA Phase II Work Plan.
- Any modifications made to the remedial design during the remedial action phase, including the purpose and results of the modifications.
- Problems encountered during the remedial action and resolutions to these problems.
- Any outstanding items from the prefinal inspection checklist that were identified and described. In responding to comments received, the prefinal inspection checklist will not be revised; rather, it will be finalized in the context of the remedial action report.
- Certification that the remedies are operational and functional. The DOE-ID will provide a statement certifying that the remedies are achieving, or have achieved, the requirements of the OU 10-04 ROD (DOE-ID 2002).
- As-built drawings showing final contours.
- Final total costs of the remedial action for Phase II activities.
- Results of the Phase II final inspection(s). Any final inspection will be documented in the draft remedial action report, submitted to the Agencies' project managers within 60 calendar days of the final inspection, and used to resolve prefinal inspection issues.

6. FIVE-YEAR REVIEW

In accordance with the “National Oil and Hazardous Substances Pollution Contingency Plan” (40 CFR 300), a statutory review of the selected remedy will be conducted no less than every 5 years for sites where contamination above the risk-based concentrations is left in place. It is the intention of this project to remove contamination to levels below the risk-based concentrations, but in the event that contamination above these concentrations remains at a given site, a 5-year review will evaluate the remedy to determine if it remains protective of human health and the environment. Five-year reviews will be conducted for remediated sites with institutional controls until the year 2095 at a minimum (i.e., until the 100-year institutional control period expires) or until it is determined during a 5-year review that controls and reviews are no longer necessary. The first 5-year review is scheduled to be conducted by October 1, 2008.

7. REFERENCES

- 36 CFR 800.4, 2004, "Identification of Historic Properties," *Code of Federal Regulations*, Office of the Federal Register, July 2004.
- 36 CFR 800.5, 2004, "Assessment of Adverse Effects," *Code of Federal Regulations*, Office of the Federal Register, July 2004.
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Appendix A

Cultural Resources Summary

Appendix A

Cultural Resources Summary

A Summary of Archaeological Surveys Completed in Advance of Ordnance Identification and Remediation 1986–1997

A1. INTRODUCTION

In 1942, a portion of what is now designated as the Idaho National Engineering and Environmental Laboratory (INEEL) was set aside by the U.S. Navy to test fire naval guns, to conduct mass detonation tests, to practice aerial bombing, and to perform explosive material compatibility tests. As a result of these activities, many projectiles (explosive and inert) and explosive residues remain within the current boundaries of the INEEL. Efforts to characterize and remediate the areas affected by these activities are ongoing. Since some remedial actions have the potential to disturb the ground, archaeological surveys have been completed in advance of most cleanup efforts.

A2. SUMMARY

A subcontractor from Idaho State University completed the first ordnance-related archaeological survey on the INEEL in 1986. At this time, the perimeter of the Naval Ordnance Disposal Area (NODA), an area now known as the NODA racetrack, was intensively examined. No archaeological resources were identified (Reed 1986). No additional ordnance-related archaeological surveys were completed until the 1990s, when characterization and cleanup were accelerated. Six archaeological surveys were completed from 1992–1997, all in advance of characterization and remediation at a variety of areas. Since 1997, cleanup activities have been restricted to areas that have been previously surveyed for archaeological resources. As a result of these efforts, some level of archaeological survey coverage has been achieved for the following locations:

- Areas surrounding the NODA
- Central Facilities Area (CFA) gravel pit and landfill complex
- Vicinity of the CFA-633 building
- Storage bunkers north of the Idaho Nuclear Technology and Engineering Center (INTEC)
- A small area east of the Test Reactor Area (TRA)
- Areas surrounding the National Oceanic and Atmospheric Administration (NOAA) facility
- Areas surrounding the now-demolished INEEL Fire Station II
- A narrow zone on either side of a 10-mi stretch of power line extending north from Antelope substation
- Area south of Argonne National Laboratory-West (ANL-W)

- Spot near Milepost 17 on Lincoln Boulevard
- Areas surrounding the Experimental Field Station
- Craters east of INTEC
- Areas surrounding the Mass Detonation Area
- Areas surrounding the Railcar Explosion Area
- Areas surrounding the Land Mine and Fuse Burn Area.

Formal and informal reports for these surveys are included in the INEEL cultural resource management (CRM) files (Pace 1996, 1997; Ringe 1992, 1993, 1994) along with letters of concurrence from the Idaho State Historic Preservation Office for some projects (i.e., 1992, 1993, 1994, and 1996). Although they were invited to provide their views in 1997, the Shoshone-Bannock Tribes have not responded.

Archaeological resources have been identified in many of the ordnance areas. Table A-1 below summarizes these findings. Note: Italicized ordnance areas are under consideration for future cleanup and remediation.

Table A-1. Archaeological resource summaries.

Ordnance Area	Total Number of Archaeological Resources in Ordnance Area	Total Number of Significant Archaeological Resources in Ordnance Area
<i>NODA</i>	Twelve	Nine: <ul style="list-style-type: none"> • 10-BT-808/94-NODA-4 • 10-BT-809 • 10-BT-812 • 10-BT-813 • 10-BT-814 • 94-NODA-3 • 94-NODA-1 • LMIT-97-21-13 • LMIT-97-21-14
CFA gravel pit and landfill complex	None	None
Vicinity of the CFA-633 building	None	None (The CFA-633 building is designated as a historic building.)
Storage bunkers north of INTEC	None	None
Area east of TRA	One	None

Table A-1. (continued).

Ordnance Area	Total Number of Archaeological Resources in Ordnance Area	Total Number of Significant Archaeological Resources in Ordnance Area
<i>NOAA facility</i>	Five	Two: <ul style="list-style-type: none"> • LMIT-97-21-5 • LMIT-97-21-6
<i>Fire Station II</i>	Four	Three: <ul style="list-style-type: none"> • LMIT-97-21-9 • LMIT-97-21-10 • LMIT-97-21-11
Power line extending north from Antelope substation	Nineteen	Ten: <ul style="list-style-type: none"> • EGG-93-ORD-2 • EGG-93-ORD-3 • EGG-93-ORD-6 • EGG-93-ORD-7 • EGG-93-ORD-9 • EGG-93-ORD-10 • EGG-93-ORD-13 • EGG-93-ORD-14 • EGG-93-ORD-19 • EGG-93-ORD-20
ANL-W	Six	One: <ul style="list-style-type: none"> • 94-ANLW-5
Milepost 17 on Lincoln Blvd.	None	None
Experimental Field Station	None	None
Craters east of INTEC	None	None
Mass Detonation Area	None	None
Railcar Explosion Area	Four	Four: <ul style="list-style-type: none"> • LMIT-96-51-4 • LMIT-96-51-5 • LMIT-96-51-6 • LMIT-96-51-7
<i>Land Mine Fuze Burn Area</i>	Two	One: <ul style="list-style-type: none"> • LMIT-96-51-3 • One unrecorded site nearby

ANL-W = Argonne National Laboratory-West

CFA = Central Facilities Area

INTEC = Idaho Nuclear Technology and Engineering Center

NOAA = National Oceanic and Atmospheric Administration

NODA = Naval Ordnance Disposal Area

TRA = Test Reactor Area

As a general rule, consultation with the State Historic Preservation Office on past cleanup efforts has resulted in the implementation of the following recommendations to protect the significant archaeological resources during ordnance identification and remediation:

- All contractor and subcontractor personnel who will enter the ordnance removal area will attend an archaeological resource protection training session offered by the INEEL CRM Office.
- All access to and from the ordnance removal areas will be restricted to existing roads and tracks. Off-road vehicle travel is approved within the boundaries of the surveyed areas, but it is not approved within the boundaries of any identified cultural resource site areas.
- If safety considerations allow, all ordnance devices will be removed from identified cultural resource site areas before detonation.
- In the event that an ordnance device cannot be safely removed from a cultural resource site area, a member of the INEEL CRM Office will be present during or immediately after the disposal process to immediately assess any impacts and stabilize any cultural materials that may be exposed.
- All work will be redirected and the INEEL CRM Office will be consulted immediately if any unusual materials (i.e., bones, charcoal-stained soil, rock alignments, obsidian flakes, pottery, stone tools) are unexpectedly encountered, particularly during subsurface activities.
- Efforts will be made to continue to offer invitations to the Shoshone-Bannock Tribes cultural resources coordinator to become involved in monitoring, surveying, and other project activities.

Proposed future cleanup and remediation at the Fire Station II, Experimental Field Station, Land Mine Fuse Burn, NOAA, and NODA areas have the potential to impact at least 14 significant archaeological sites. The recommendations summarized above in regard to worker education, archaeological monitoring, stop work, and tribal involvement should be implemented for the work. In addition, archaeological survey should be expanded as necessary to encompass all of the lands that might require remediation. Under present plans, it appears that the following portions of these areas remain unsurveyed:

- 4 acres on north end of Fire Station II
- 1 acre on southeastern end of Experimental Field Station
- 20 acres north of the Big Lost River at NODA.

Archaeological surveys must be completed in the above areas to fully assess the effects of the proposed cleanup and remediation.

A3. REFERENCES (ANNOTATED) CITED

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- The report presents documentation of intensive archaeological survey of a 20-acre cleanup area at the Railcar Explosion Area, a 27-acre area at the Land Mine/Fuse Burn Area, and a 10-acre area east of TRA. Seven archaeological resources are identified, five potentially eligible for nomination to the National Register of Historic Places and recommended for protection (four at Railcar Area,

one at Fuse Burn Area). Standard recommendations include removal of ordnance devices for detonation whenever possible in sensitive areas, archaeological monitoring/salvage after in-place detonation and sampling, and worker education in archaeological protection. Recommendations to limit off-road vehicle use also are included. Idaho State Historic Preservation Office concurrence is noted (R. M. Yohe to Brenda Ringe Pace, "Archaeological Reports, LMIT-95-6, Ordnance Cleanup Project," November 19, 1996).

Pace, Brenda Ringe, 1997, "Archaeological Surveys for 1997 Ordnance Removal Actions," Internal Report No. LMIT-97-21.

- Report presents documentation of intensive archaeological survey of a 2-acre area at the Experimental Field Station, a 13-acre area at the Fire Station II area, a 32-acre area at the Railcar Explosion Area, a 74-acre area at the Mass Detonation Area, a 33-acre area at the National Oceanic and Atmospheric Administration area, a 112-acre area at the Naval Ordnance Disposal Area, and a 15-acre area of craters east of INTEC. Four previously recorded archaeological resources are identified and 15 new archaeological resources are identified, 10 potentially eligible for nomination to the National Register of Historic Places (two at Fire Station II, two at NOAA, six at NODA). Standard recommendations included removal of ordnance devices for detonation whenever possible in sensitive areas, archaeological monitoring/salvage after in-place detonation and sampling, and worker education in archaeological protection. Recommendations to limit off-road vehicle use also are included.

Reed, W. G., 1986, "An Archaeological Survey of the Naval Ordnance Disposal Area of the Idaho National Engineering Laboratory," *Swanson/Crabtree Anthropological Research Laboratory Reports of Investigations: 86-17*.

- This report presents documentation of intensive archaeological survey of the NODA "racetrack" by a subcontractor from Idaho State University. No archaeological resources are identified.

Ringe, Brenda L., 1992, Letter to M. W. Lusk, January 23, 1992, "Archaeological Considerations in the Removal of Unexploded Ordnance from the INEL," *BLR-05-92*, INEEL Cultural Resource Management Archives.

- This document represents a clearance recommendation for cleanup of surface ordnance at miscellaneous locations, including CFA gravel pit/landfill complex, CFA-633, NOAA, an area east of TRA, Fire Station II, and at storage bunkers near INTEC. It includes recommendation for archaeological survey of power line extending north of Antelope Substation before cleanup activities. Archaeological surveys are recommended in areas not previously examined (power line) and in any future proposed cleanup areas (aerial bombing ranges near the Radioactive Waste Management Complex and ANL-W, firing fan between the Naval Ordnance Training Facility and Big Southern Butte). Cleanup in archaeologically sensitive areas is recommended for archaeological monitoring and postcleanup salvage. Worker education in archaeological protection also is recommended. Idaho State Historic Preservation Office concurrence is noted (T. Green to A. Williams, "Unexploded Ordnance Interim Action Cultural Resources Assessment, INEL," April 7, 1992).

Ringe, Brenda L., 1993, "Archaeological Surveys for the Idaho National Engineering Laboratory Ordnance Cleanup," *External Report No. EGG-CS-10995*.

- Report presents documentation of intensive archaeological survey of 11-mi-long power line corridor in advance of ordnance cleanup. Nineteen archaeological resources are identified,

10 potentially eligible for nomination to the National Register of Historic Places and recommended for protection. Recommendations include removal of ordnance devices for detonation whenever possible in sensitive areas, archaeological monitoring/salvage after in-place detonation and sampling, and worker education in archaeological protection. Idaho State Historic Preservation Office concurrence is noted (R. M. Yohe to B. L. Ringe, "EGG-93-7, INEL Site-wide Ordnance Cleanup," June 25, 1993).

Ringe, Brenda L., 1994, "Archaeological Surveys for Ordnance Remediation at ANL-W and the NODA on the INEL," *External Report No. EGG-CS-11319*.

- Report presents documentation of intensive archaeological survey of 40-acre² area surrounding NODA racetrack, 90-acre area south of ANL-W, and small location near Milepost 17 along Lincoln Boulevard. Ten archaeological resources are identified, four potentially eligible for nomination to the National Register of Historic Places and recommended for protection (three at NODA, one at ANL-W). Standard recommendations included removal of ordnance devices for detonation whenever possible in sensitive areas, archaeological monitoring/salvage after in-place detonation and sampling, and worker education in archaeological protection. Idaho State Historic Preservation Office concurrence on eligibility is noted (R. M. Yohe to B. L. Ringe, Cultural Resource Draft Report BLR-19-94, Argonne National Laboratory-West, Naval Ordnance Disposal Area, July 5, 1994).

Appendix B

Air Emissions Analysis for Detonation of Trinitrotoluene and Royal Demolition Explosive Fragments, Waste Area Group 10

Appendix B

Air Emissions Analysis for Detonation of Trinitrotoluene and Royal Demolition Explosive Fragments, Waste Area Group 10

B1. INTRODUCTION

Waste Area Group (WAG) 10, which is part of the Idaho Completion Project, is planning to remediate five soil sites contaminated with the explosives trinitrotoluene (TNT) and Royal Demolition Explosive (RDX) as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial action for Operable Unit 10-04. These explosive remnants are legacy material from munitions testing on the Idaho National Engineering and Environmental Laboratory (INEEL). Soil and TNT/RDX fragments will be removed from the sites with the TNT/RDX fragments segregated and treated by detonation on the INEEL. The rest of the contaminated soil will be disposed of on or off the INEEL, but it will not be treated. The project will be performed in 2007. The focus of this air emissions analysis is on the detonation products of the TNT/RDX fragments.

B2. ASSUMPTIONS AND METHODS

The TNT/RDX would be detonated at the Mass Detonation Area (MDA) on the INEEL (Figure B-1). The MDA is located 1.6 km east of Mile Marker 8 on Lincoln Boulevard, north of the Idaho Nuclear Technology and Engineering Center (INTEC) and east of the Naval Reactors Facility (NRF). The entire MDA encompasses about 322 ha (796 acres). The specific area chosen for detonation of the WAG 10 TNT/RDX fragments is a crater within the MDA, having approximate coordinates E 309536, N 718775 (State Plane, Idaho East Zone 1101, U.S. Survey Feet, Horizontal Datum NAD-27).

Although the exact quantity and mix of TNT/RDX fragments is not known, a bounding estimate for air emission calculations is 30 lb (13.6 kg) of material. The worse-case explosive from an emissions standpoint is TNT, so the entire 30 lb is assumed to be TNT. Detonation emission rates from TNT for carbon monoxide (CO), ammonia (NH₃), and hydrogen cyanide (HCN) are 796, 29, and 27 lb/ton TNT, respectively (EPA, AP-42, Chapter 13.3, "Explosives Detonation," Table 13.3-1) (EPA 1980).

The model chosen for modeling downwind concentrations of contaminants from the detonation was the U.S. Environmental Protection Agency's (EPA's) TSCREEN (Toxics Screening) model. The model was downloaded from EPA's Support Center for Regulatory Air Models (SCRAM) website. The model is essentially the widely used SCREEN3 code with provisions for a "puff" release. The input parameters selected were:

- Gaseous release
- Discharge from equipment opening (most applicable case)
- 1 g material released (unit release is scaled to actual releases)
- Release height = 0 m
- Initial horizontal and vertical dispersion set to 0 m (most conservative case)
- Instantaneous release.

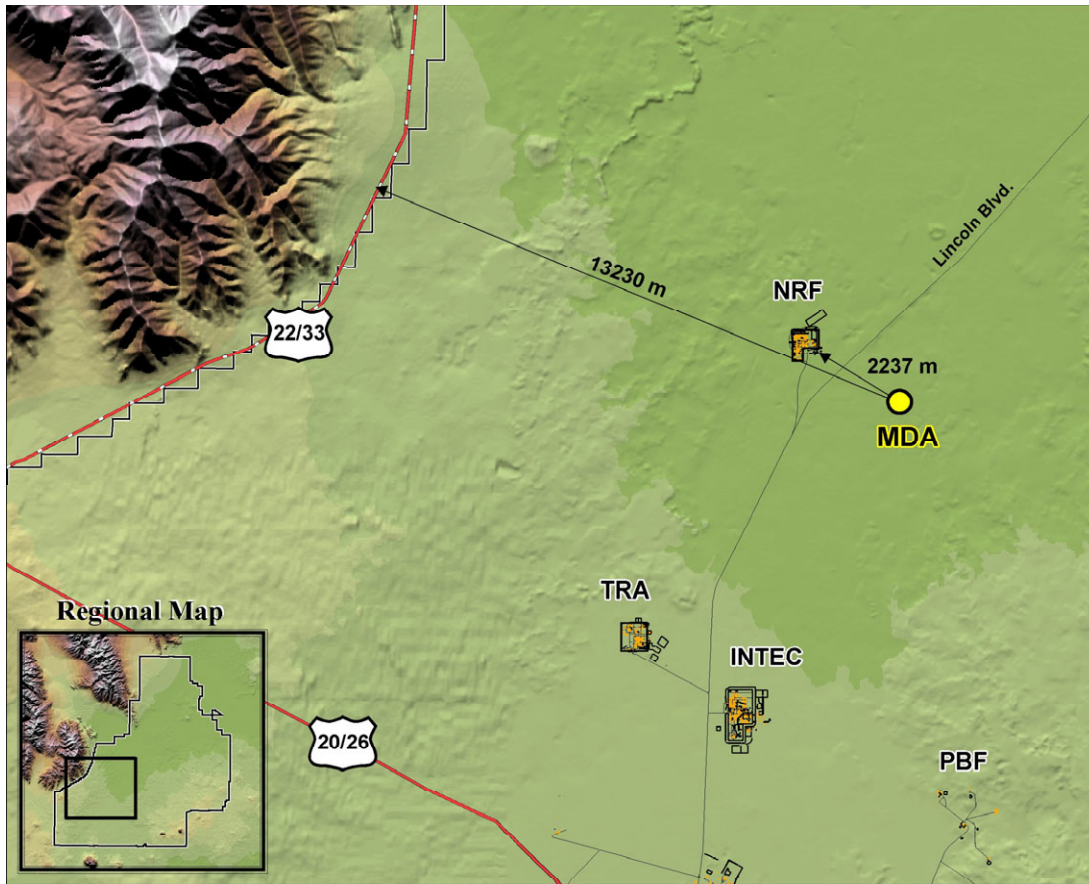


Figure B-1. Location of the Mass Detonation Area on the Idaho National Engineering and Environmental Laboratory and the distances to nearest receptors.

Two model runs were performed, corresponding to the distances to the nearest highway (State Highway 22/33, 13230 m WNW) and nearest facility (NRF, 2237 m NW). The 1-hour average concentration is used for comparison with State of Idaho air limits. The TSCREEN code outputs are included as Appendix B-1.

B3. RESULTS

Table B-1 presents results of TSCREEN modeling. One-hour average concentrations at both the State Highway 22/33 receptor and the NRF fence line would be below limits set by the State of Idaho Department of Environmental Quality. These calculated concentrations are based on conservative release assumptions and conservative modeling; actual concentrations are expected to be lower.

Table B-1. Releases and modeling results for trinitrotoluene detonation at the Mass Detonation Area.

Detonation Product	Grams Released ^a	Unit Release Concentration (1-hr Average, mg/m ³ /g) @ 2,237 m (NRF Fence)	Unit Release Concentration (1-hr Average mg/m ³ /g) @ 13,230 m (State Hwy 22/33)	Average Concentration at 2,237 m (NRF Fence) (mg/m ³)	Average Concentration at 13,230 m (State Hwy 22/33) (mg/m ³)	State of Idaho Limit (mg/m ³) ^b	Type of Limit
CO	5,421	8.4E-04	5.8E-05	4.6	0.3	40	AAQS
NH ₃	197	8.4E-04	5.8E-05	0.07	0.005	0.9	AAC
HCN	184	8.4E-04	5.8E-05	0.06	0.004	0.25	AAC

a. Based on 30 lb of TNT and AP-42 emission factors.

b. Averaging times are 1 hour for CO and 24 hours for NH₃ and HCN.

HCN = hydrogen cyanide

B4. REFERENCES

EPA, 1980, "Compilation of Air Pollutant Emission Factors," AP-42, Fifth Edition, Volume 1, *Stationary Point and Area Sources*, U.S. Environmental Protection Agency, February 1980.

Appendix B1

TSCREEN Output Files

Appendix B1

TSCREEN Output Files

TSCREEN OUTPUT FILE

TNT Detonation - concentrations at Hwy 22/33

TOTAL AMOUNT OF MATERIAL RELEASED (G): 1.000
RELEASE HEIGHT ABOVE GROUND (M): .0000
INITIAL LATERAL DISPERSION SIGMA (Y) (M): .0000
INITIAL VERTICAL DISPERSION SIGMA (Z) (M): .0000

*** SUMMARY OF PUFF MODEL RESULTS ***

THE MAXIMUM CONCENTRATION AND THE DISTANCE TO MAXIMUM
CONCENTRATION FOR DISTANCES BEYOND FENCELINE **13.230** (KM) .
FOR NEAR SURFACE RELEASE MAXIMUM CONCENTRATION WILL OCCUR AT
THE FENCELINE.

AVERAGING TIME (MIN)	MAXIMUM CONCENTRATION (G/M**3)	DISTANCE TO MAX. CONC. (KM)	STABILITY CLASS
*INSTANTANEOUS	8.957E-07	13.230	S
1	8.805E-07	13.230	S
5	6.224E-07	13.230	S
15	2.324E-07	13.230	S
60	5.810E-08	13.230	S

** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

*** PUFF DISTANCES ***

THE MAXIMUM CONCENTRATION AS A FUNCTION OF DOWNWIND DISTANCE
AND THE CONDITIONS THAT PRODUCED THE MAXIMUM AT THAT DISTANCE.

MIXING HEIGHT (M) 320.
WIND SPEED (M/SEC) 1.0

AVERAGING TIME (MIN)	DOWNWIND DISTANCE (KM)					
	MAXIMUM CONCENTRATION (G/M**3) AT VARIOUS DOWNWIND DISTANCES.					
	STABILITY CLASS THAT PRODUCED THE MAX. LISTED BELOW					
	0.01	0.03	0.05	0.07	0.1	0.5
*INST.	1.005E+01	1.500E+00	5.024E-01	2.344E-01	1.024E-01	2.246E-03
	S	S	S	S	S	S
1	1.678E-01	3.229E-02	1.501E-02	9.058E-03	5.305E-03	4.745E-04
	S	S	S	S	S	S

5	3.355E-02	6.457E-03	3.001E-03	1.812E-03	1.061E-03	9.490E-05
	S	S	S	S	S	S
15	1.118E-02	2.152E-03	1.000E-03	6.039E-04	3.537E-04	3.163E-05
	S	S	S	S	S	S
60	2.796E-03	5.381E-04	2.501E-04	1.510E-04	8.842E-05	7.908E-06
	S	S	S	S	S	S

AVERAGING DOWNWIND DISTANCE (KM)

TIME (MIN) MAXIMUM CONCENTRATION (G/M**3) AT VARIOUS DOWNWIND DISTANCES.

STABILITY CLASS THAT PRODUCED THE MAX. LISTED BELOW

	1.0	3.0	5.0	7.0	10.0	30.0
*INST.	4.291E-04	3.107E-05	9.166E-06	4.101E-06	1.749E-06	1.266E-07
	S	S	S	S	S	S
1	1.675E-04	2.493E-05	8.344E-06	3.892E-06	1.700E-06	1.261E-07
	S	S	S	S	S	S
5	3.355E-05	6.457E-06	3.001E-06	1.803E-06	1.020E-06	1.149E-07
	S	S	S	S	S	S
15	1.118E-05	2.152E-06	1.000E-06	6.039E-07	3.537E-07	6.672E-08
	S	S	S	S	S	S
60	2.796E-06	5.381E-07	2.501E-07	1.510E-07	8.842E-08	1.702E-08
	S	S	S	S	S	S

STABILITY CLASSES

U = UNSTABLE

N = NEUTRAL

S = STABLE

* INDICATES AVERAGING TIME THAT WAS SELECTED FOR PLOTTING

*** END OF PUFF MODEL OUTPUT ***

TSCREEN OUTPUT FILE

TNT Detonation - concentrations at NRF fenceline

TOTAL AMOUNT OF MATERIAL RELEASED (G): 1.000
 RELEASE HEIGHT ABOVE GROUND (M): .0000
 INITIAL LATERAL DISPERSION SIGMA (Y) (M): .0000
 INITIAL VERTICAL DISPERSION SIGMA (Z) (M): .0000

 *** SUMMARY OF PUFF MODEL RESULTS ***

THE MAXIMUM CONCENTRATION AND THE DISTANCE TO MAXIMUM
 CONCENTRATION FOR DISTANCES BEYOND FENCELINE **2.237 (KM)**.
 FOR NEAR SURFACE RELEASE MAXIMUM CONCENTRATION WILL OCCUR AT
 THE FENCELINE.

AVERAGING TIME (MIN)	MAXIMUM CONCENTRATION (G/M**3)	DISTANCE TO MAX. CONC. (KM)	STABILITY CLASS
*INSTANTANEOUS	6.266E-05	2.237	S
1	4.426E-05	2.237	S
5	1.003E-05	2.237	S
15	3.343E-06	2.237	S
60	8.357E-07	2.237	S

 ** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **

 *** PUFF DISTANCES ***

THE MAXIMUM CONCENTRATION AS A FUNCTION OF DOWNWIND DISTANCE
 AND THE CONDITIONS THAT PRODUCED THE MAXIMUM AT THAT DISTANCE.

MIXING HEIGHT (M) 320.
 WIND SPEED (M/SEC) 1.0

AVERAGING TIME (MIN)	DOWNWIND DISTANCE (KM)					
	MAXIMUM CONCENTRATION (G/M**3) AT VARIOUS DOWNWIND DISTANCES.					
	STABILITY CLASS THAT PRODUCED THE MAX. LISTED BELOW					
	0.01	0.03	0.05	0.07	0.1	0.5
*INST.	1.005E+01	1.500E+00	5.024E-01	2.344E-01	1.024E-01	2.246E-03
	S	S	S	S	S	S
1	1.678E-01	3.229E-02	1.501E-02	9.058E-03	5.305E-03	4.745E-04
	S	S	S	S	S	S
5	3.355E-02	6.457E-03	3.001E-03	1.812E-03	1.061E-03	9.490E-05
	S	S	S	S	S	S
15	1.118E-02	2.152E-03	1.000E-03	6.039E-04	3.537E-04	3.163E-05
	S	S	S	S	S	S
60	2.796E-03	5.381E-04	2.501E-04	1.510E-04	8.842E-05	7.908E-06

	S	S	S	S	S	S
AVERAGING	DOWNWIND DISTANCE (KM)					
TIME (MIN)	MAXIMUM CONCENTRATION (G/M**3) AT VARIOUS DOWNWIND DISTANCES.					
	STABILITY CLASS THAT PRODUCED THE MAX. LISTED BELOW					
	1.0	3.0	5.0	7.0	10.0	30.0
*INST.	4.291E-04	3.107E-05	9.166E-06	4.101E-06	1.749E-06	1.266E-07
	S	S	S	S	S	S
1	1.675E-04	2.493E-05	8.344E-06	3.892E-06	1.700E-06	1.261E-07
	S	S	S	S	S	S
5	3.355E-05	6.457E-06	3.001E-06	1.803E-06	1.020E-06	1.149E-07
	S	S	S	S	S	S
15	1.118E-05	2.152E-06	1.000E-06	6.039E-07	3.537E-07	6.672E-08
	S	S	S	S	S	S
60	2.796E-06	5.381E-07	2.501E-07	1.510E-07	8.842E-08	1.702E-08
	S	S	S	S	S	S

STABILITY CLASSES

U = UNSTABLE

N = NEUTRAL

S = STABLE

* INDICATES AVERAGING TIME THAT WAS SELECTED FOR PLOTTING

 *** END OF PUFF MODEL OUTPUT ***

Appendix C

Waste Management Plan

Appendix C

Waste Management Plan

C1. PURPOSE/INTRODUCTION

The purpose of this Waste Management Plan is to establish requirements for the management and disposal of waste generated during the recovery, excavation, transportation, and disposal activities of trinitrotoluene (TNT) and Royal Demolition Explosive (RDX) contaminated soil from various sites at the Idaho National Engineering and Environmental Laboratory (INEEL). These work activities will be performed under Waste Area Group (WAG) 10, Operable Unit (OU) 10-04 at the INEEL. The scope of this plan covers industrial and hazardous waste generated as a result of OU 10-04 remediation activities conducted at TNT/RDX contaminated sites at the INEEL. This plan allows for the disposition of waste at approved on-Site treatment and disposal facilities or off-Site treatment and disposal facilities, as deemed necessary. The plan also provides reference to the applicable waste management requirements that are contained in U.S. Department of Energy Idaho Operations Office (DOE-ID) documents. The overall scope of the OU 10-04 remediation activities is presented in the main body of this report, "Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II."

Activities that could likely generate waste include, but are not limited to, the following:

- Performing manual recovery of TNT/RDX fragments
- Detonating TNT/RDX fragments
- Excavating TNT/RDX contaminated soil
- Performing field screening and sampling
- Performing on-Site stabilization (at the Staging, Storage, Sizing, and Treatment Facility) of soil and/or microencapsulation of debris, as necessary
- Decontaminating equipment and materials
- Performing packaging, transportation, and disposal activities
- Performing reclamation of the terrain (including backfilling, contouring, and revegetation).

C2. PROJECT-SPECIFIC WASTE CHARACTERISTICS

Several distinct waste types could be generated during this project as a result of remediation activities, including the following:

- TNT/RDX fragments
- Soil, gravel, and rock
- Personal protective equipment (PPE)

- Plastic sheeting, sampling debris, etc.
- Hydraulic oil spills
- Liquid decontamination residue
- Solid decontamination residue.

Some of this waste may be clean, but much of it could be contaminated. Subsequent to generation, any or all of the waste may be reclassified. Resource Conservation and Recovery Act (RCRA) -regulated constituents (42 USC § 6901 et seq.) previously encountered in soil samples collected from the sites are provided in Table C-1. Because the analyses performed were for total concentrations, the results are converted to toxicity characteristic leaching procedure (TCLP) concentrations using the 20X rule of dilution.

Table C-1. Resource Conservation and Recovery Act-regulated constituent totals and toxicity characteristic leaching procedure concentrations.

Area	Contaminant	Total Concentration (mg/kg)	TCLP Concentration (mg/L) ^a	TCLP Regulatory Concentration (mg/L)
Land Mine and Fuze Burn Area	2,4-Dinitrotoluene	23.6	1.18	0.13
Fire Station II Zone and Range Fire Burn Area	Lead	23.6	1.18	5.0
	Selenium	1.6	0.08	1.0
Naval Ordnance Disposal Area	Barium	1,740.0	87.0	100.0
	Cadmium	13.3	0.66	1.0
	Chlorobenzene	0.067	0.003	100.0
	Chromium	67.6	3.38	5.0
	Lead	1,790.0	89.5	5.0
	Mercury	2.4	0.12	0.2
	Pentachlorophenol	0.32	0.016	100.0
	Silver	11.0	0.55	5.0

a. The TCLP concentrations were obtained by dividing the total concentrations by 20 following the 20X rule of dilution. Therefore, these concentrations reflect a conservative estimate of the actual TCLP concentrations.

TCLP = toxicity characteristic leaching procedure

Based upon these results, the 2,4-dinitrotoluene TCLP concentration in the Land Mine and Fuze Burn Area exceeds the regulatory level, as does the lead TCLP concentration for the Naval Ordnance Disposal Area (NODA). Further characterization of soil for the toxicity characteristic will need to be performed prior to direct disposal of contaminated soil to determine whether the soil is truly characteristic. If the soil is determined to be characteristic, it will require stabilization prior to disposal.

C3. WASTE IDENTIFICATION

Based on a review of work activities and previously collected analytical data, the following potential waste types have been identified:

- **Industrial waste:** Solid waste generated by industrial processes, manufacturing, and support processes (40 CFR 243, “Guidelines for the Storage and Collection of Residential, Commercial, and Industrial Solid Waste”). At the INEEL, industrial waste to be disposed of at the INEEL Landfill Complex does not include hazardous waste, radioactive waste, or land disposal restricted waste regulated under Subtitle C of the RCRA (DOE-ID 2004).
- **Hazardous waste:** Solid waste designated as hazardous by the U.S. Environmental Protection Agency RCRA regulations (40 CFR 261.3, “Definition of Hazardous Waste”).

Waste that may be generated during remediation activities is summarized in Table C-2. This table describes the waste types, provides the anticipated disposition pathway, and references the waste acceptance criteria or guidance for management. For the ICDF landfill, the waste acceptance criteria concentration guidelines for TNT and RDX are 11 mg/kg and 10 mg/kg, respectively. The landfill waste acceptance criteria maximum masses for TNT and RDX are 8,400 kg and 7,900 kg, respectively. Neither a concentration guideline nor a maximum mass currently exists for 1,3-dinitrobenzene. If the TNT or RDX contaminated soil to be disposed of exceeds the ICDF landfill waste acceptance criteria, a proposed revision to the criteria will be submitted to the Agencies for their review and approval to allow for the disposal. Because a criterion does not currently exist for 1,3-dinitrobenzene, ICDF Complex personnel will petition the Agencies to implement a criterion for it. If the contaminated soil cannot be disposed of at the ICDF Complex, an off-Site treatment and disposal facility will need to be identified.

Table C-2. Possible waste generation and disposition.

Waste Description	Waste Type	Disposition Pathway ^a	Appropriate Waste Acceptance Criteria/Guidance
Administrative waste (paper products, office waste)	Industrial	ICDF landfill	ICDF landfill waste acceptance criteria
Contaminated soil	Hazardous	ICDF landfill	ICDF waste acceptance criteria
Uncontaminated monitoring waste	Industrial	ICDF landfill	ICDF waste acceptance criteria
Contaminated monitoring waste	Hazardous	ICDF landfill	ICDF waste acceptance criteria
Uncontaminated PPE (gloves, boots, shoe covers, coveralls, etc.)	Industrial	ICDF landfill	ICDF waste acceptance criteria
Contaminated PPE (gloves, boots, shoe covers, coveralls, etc.)	Hazardous	ICDF landfill	ICDF waste acceptance criteria
Uncontaminated sampling waste (wipes, spoons, etc.)	Industrial	ICDF landfill	ICDF waste acceptance criteria
Contaminated sampling waste (wipes, spoons, etc.)	Low-level or hazardous	ICDF landfill	ICDF waste acceptance criteria

Table C-2. (continued).

Waste Description	Waste Type	Disposition Pathway ^a	Appropriate Waste Acceptance Criteria/Guidance
Liquid and solid decontamination residues	Hazardous	ICDF Complex	ICDF waste acceptance criteria
Petroleum-contaminated media (i.e., soil, plastic sheeting, and PPE from hydraulic fluid spills)	Industrial	INEEL landfill	ICDF waste acceptance criteria
Contaminated equipment that cannot be decontaminated	Hazardous	ICDF landfill	ICDF waste acceptance criteria
Maintenance-related waste (from vehicles, equipment, facilities, etc.)	Industrial	INEEL landfill	ICDF waste acceptance criteria
Spent or unusable (e.g., expired) chemicals, reagents, and field test kits	Industrial or hazardous	ICDF landfill	ICDF waste acceptance criteria
Miscellaneous waste (tools, debris, equipment, metal/plastic pipe, plastic sheeting, etc.)	Industrial or hazardous	ICDF landfill	ICDF waste acceptance criteria

a. The ultimate disposition path is contingent upon meeting the appropriate facility's waste acceptance criteria. If the waste does not meet the waste acceptance criteria, and an alternative on-Site treatment and disposal location is not available, then off-Site waste management options will be pursued.
ICDF = INEEL CERCLA Disposal Facility

C4. WASTE DESIGNATION AND MANAGEMENT

All generated waste will be characterized as required by RCRA regulations (40 CFR 262.11, "Hazardous Waste Determination"). Hazardous waste determinations will be prepared for each waste stream in accordance with the requirements delineated in Management Control Procedure (MCP) -63, "Waste Generator Services—Industrial Waste Management."

Waste generated from the TNT/RDX contaminated soil sites will be designated and characterized using process knowledge, historical analytical data, and/or analytical data generated during the course of remediation activities. The Waste Generator Services organization will maintain completed hazardous waste determinations for all waste streams as part of the project file. Potential waste streams that might be generated during remediation activities include the following:

- Industrial solid waste to be disposed of at the INEEL Landfill Complex
- Hazardous solid waste (i.e., noncharacteristic soil) to be disposed of at the ICDF
- Hazardous solid waste (i.e., characteristic soil) to be stabilized and disposed of at the ICDF
- Hazardous solid waste (i.e., RCRA-regulated debris) to be macroencapsulated and disposed of at the ICDF
- TNT and RDX fragments to be detonated at the Mass Detonation Area.

Once the hazardous waste determinations are completed, the appropriate information will be entered into the INEEL Integrated Waste Tracking System (IWTS). All waste must meet the applicable waste acceptance criteria for the intended treatment/disposal facility prior to disposal.

C4.1 Industrial Waste

Solid waste and debris that are not contaminated (not a RCRA characteristic, listed, or mixed waste) and have been radiologically released are considered industrial waste. This waste may be disposed of at the INEEL Landfill Complex, subject to meeting that facility's waste acceptance criteria. Industrial waste generated during remediation activities will be transported to the INEEL Landfill Complex, which is located at Central Facilities Area (CFA), for disposal. The waste must meet the waste acceptance criteria, which are described in the *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* (DOE-ID 2004), prior to disposal at the landfill. The *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria* (DOE-ID 2004) document requires some industrial waste to be segregated and managed as conditional industrial waste. Conditional industrial waste includes oil or fuel filters, petroleum-contaminated material from spills, asbestos-containing materials, or uncontaminated PPE.

C4.2 Hazardous Waste

Contaminated (hazardous) solid waste (nonaqueous) that meets the ICDF waste acceptance criteria will be treated and disposed of at the ICDF. Contaminated aqueous waste that meets the ICDF waste acceptance criteria will be solidified and disposed of at the ICDF. Aqueous and nonaqueous waste not meeting the disposal requirements of the ICDF will be containerized, treated, and/or stored (as necessary) until appropriate treatment/disposal criteria are met. If management/disposal at INEEL facilities is not possible, then waste may be sent to an approved off-Site facility for treatment/disposal, subject to meeting the applicable waste acceptance criteria and off-Site criteria.

C4.3 Explosive Fragments

Explosive fragments (including TNT and RDX) will be recovered and transported to the Mass Detonation Area where they will be disposed of by detonation. Those fragments that are determined to pose an unacceptable hazard to personnel to be safely handled and transported for detonation will be disposed of by in-place detonation. A safety assessment will be performed for the identified explosives and a decision to remove, detonate in place, or isolate the identified explosive will be based on the determined hazard level.

C4.4 Waste Storage

While waste is being actively generated by OU 10-04 TNT/RDX contaminated soil remedial operations, the waste will be temporarily managed and stored within the designated work area in containers appropriate for the type of waste being generated (e.g., hazardous liquids require secondary containment). Unless being actively filled, the containers shall remain closed at all times. The volume of waste stored at the site shall be kept to a minimum.

Whenever possible, the waste containers will be removed from the active work area directly to the ICDF or the CFA Landfill Complex, as appropriate. If temporary storage is required, a staging area will be established within the area of concern. Waste stored there will be labeled and roped off in compliance with applicable company and regulatory requirements. If the waste is stored at the treatment/disposal facility, the Comprehensive Environmental Response, Compensation, and Liability Act

(CERCLA)-regulated waste (42 USC § 9601 et seq.) will be managed in accordance with that facility's waste management plan.

If direct transfer of small waste containers (i.e., drums or boxes) to the treatment/disposal facility is not feasible, containers may be stored temporarily in an established CERCLA storage area located in the CFA-637 building. This could be necessary pending container profile approvals and facility acceptance. If temporary storage is required due to space limitations or safety concerns, the CERCLA storage area may be expanded or a new CERCLA storage area may be established to accommodate the waste.

The CERCLA storage area is located at CFA and managed in accordance with the substantive requirements of RCRA, as applicable, for temporary storage of waste (40 CFR 264, Subpart I, "Use and Management of Containers"). For example, if CERCLA waste with RCRA waste codes is stored in a CERCLA storage area, then the following items are located, tested, and maintained, unless hazards associated with the waste streams would not require the item:

1. Current copy of the registration posted at the CERCLA storage area
2. Communications, spill control, and safety equipment, as identified in the *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites* (ICP 2004)
3. "NO SMOKING" signs at or near a CERCLA storage area that stores ignitable or reactive waste.

Additional requirements include appropriate management of containers at the CERCLA storage area that includes the following:

1. Maintain the containers in good condition
2. Do not store waste that is incompatible with containers (or container liners) or place the waste in a container that previously held an incompatible waste or material
3. Keep all containers closed except when adding, removing, sampling, or measuring waste
4. Do not mix incompatible waste
5. Maintain sufficient aisle space (minimum of 71 cm [28 in.]) to allow the unobstructed movement of emergency equipment and personnel
6. Do not open, handle, or store any container in a manner that will cause it to leak
7. Perform and document weekly CERCLA storage area inspections by qualified personnel.

Personnel trained in the management of a CERCLA waste storage area inspect the temporary storage area weekly. The purpose of the inspections is to evaluate container integrity, verify correct container labeling, and correct any noted deficiency or issue. Inspections are documented on the CERCLA storage area checklist that is maintained within each CERCLA storage area. "Temporary Storage of CERCLA-Generated Waste at the INEEL Site" (ICP-MCP-3475) will be used as guidance on storage and inspection of each CERCLA storage area. The CERCLA storage area will be signed and access controlled to ensure that no unauthorized access occurs by untrained personnel.

C5. WASTE PACKAGING, LABELING, AND TRANSPORTATION

Containers used to store CERCLA-regulated waste must be in good condition, compatible with the waste being stored, and properly labeled. The INEEL Waste Acceptance Criteria document (DOE-ID 2004) details the criteria for waste packaging. Containers for the collection of this waste will be clearly labeled to identify waste type and will be maintained inside the work area until removal for subsequent waste management activities. The INEEL Waste Acceptance Criteria document (DOE-ID 2004) also provides guidance to ensure that the containers selected for storage and the method of packaging are compatible with final disposition plans and applicable U.S. Department of Transportation requirements. Following this guidance will alleviate the need for repackaging the waste before shipment to a treatment or disposal facility.

The types of containers that may be used for storage and transport of waste streams generated during remedial activities include the following:

- Plastic bags
- 19-L (5-gal) open-head drums and/or 208-L (55-gal) open-head drums
- 1.2 × 1.2 × 2.4-m (4 × 4 × 8-ft) metal waste boxes (or equivalent)
- Roll-off containers lined with burrito bags
- End-load dump trucks.

Roll-off containers lined with burrito bags will be used for soil and other solid waste intended for direct disposal in the ICDF landfill. End-load dump trucks may be used for waste requiring storage in the ICDF bulk storage area pending treatment required to meet the land disposal restrictions before disposal in the ICDF landfill. Bags, drums, and waste boxes may be used for other solid waste types pending direct disposal or treatment, as required (e.g., construction debris, PPE, or sampling waste). All waste will be containerized in compliance with the facility's waste acceptance criteria, based on specific storage, treatment, and disposal requirements at the receiving facility. The packaging is intended to protect against contaminant migration and environmental degradation. Low-volume contaminated waste associated with activities may be bagged, taped, and labeled. To reduce the number of separate bags, similar waste may be combined and accounted for in one bag and/or container in consultation with Waste Generator Services personnel. During site activities, the workers will transport this bagged material in a protective manner (i.e., containment of the material is maintained). The waste may be either directly transported to the disposal facility or accumulated in a container (or containers) at the CERCLA storage area already established at CFA and will be managed pending approval and transport to its final disposition path.

Containers will be marked and labeled appropriately to match the designation established for each waste stream. Uncontaminated waste will be placed in containers marked as "Cold Waste." Containers will be marked with labels identifying them as "CERCLA Waste" if contaminated or as "Cold Waste" if uncontaminated.

Standard green and yellow CERCLA waste labels shall include appropriate information on the waste packaging, as follows:

- The accumulation start data
- Name of generating facility (e.g., OU 10-04)

- Waste description
- Phone number of generator contact
- Listed or characteristic code(s), if applicable.

Other labels and markings may include, as applicable:

- Waste package gross weight
- U.S. Department of Transportation marking/labels
- Waste stream or material identification number as assigned by Waste Generator Services
- Other labels and markings as required by 49 CFR 172 Subparts D and E.

A unique bar code serial number from the INEEL IWTS also will be placed on the container to facilitate management. The boxes and containers shall, at a minimum, be labeled on one side with the “CERCLA Waste” label and the IWTS sticker (visible side labeled) prior to transportation.

Any of the above information that is not known when the waste is labeled may be added when the information becomes available. Waste Generator Services will provide the unique bar codes and serial numbers. A new bar code will be affixed to each container when waste is first placed in the container. In addition, waste labels must be visible, legibly printed or stenciled, and placed so that a full set of labels and markings are readily visible.

Packaging and labeling for transportation shall meet U.S. Department of Transportation requirements, as appropriate. Packaging exceptions to these requirements, which are documented and provide an equivalent degree of safety during transportation, may be used for on-Site waste shipments. Containers will be labeled and marked appropriately to match the designation established for each waste stream.

C6. WASTE MINIMIZATION AND SEGREGATION

Waste minimization techniques will be incorporated primarily through design, planning, and efficient operations. Specific waste minimization practices to be implemented during the project will include, but not be limited to, the following:

- Excluding materials that could become hazardous waste in the decontamination process (if any)
- Controlling transfer of materials and equipment between clean and contaminated zones
- Designing containment such that spread of contamination is minimized
- Deploying appropriate decontamination methods.

Reuse and recycling opportunities also will be evaluated for waste, such as batteries, scrap metal, and equipment or materials that are no longer needed. Uncontaminated equipment that is determined to be excess will be evaluated for reuse by other INEEL projects or government surplus sale.

C7. REFERENCES

- 40 CFR 243, 2002, “Guidelines for the Storage and Collection of Residential, Commercial, and Institutional Solid Waste,” *Code of Federal Regulations*, Office of the Federal Register, February 2002.
- 40 CFR 261.3, 2004, “Definition of Hazardous Waste,” *Code of Federal Regulations*, Office of the Federal Register, May 2004.
- 40 CFR 262.11, 2004, “Hazardous Waste Determination,” *Code of Federal Regulations*, Office of the Federal Register, May 2004.
- 40 CFR 264, Subpart I, 2004, “Use and Management of Containers,” *Code of Federal Regulations*, Office of the Federal Register, April 2004.
- 49 CFR 172, Subpart D, 2004, “Marking,” *Code of Federal Regulations*, Office of the Federal Register, April 2004.
- 49 CFR 172, Subpart E, 2004, “Labeling,” *Code of Federal Regulations*, Office of the Federal Register, April 2004.
- 42 USC § 6901 et seq., 1976, “Resource Conservation and Recovery Act (Solid Waste Disposal Act),” *United States Code*, October 21, 1976.
- 42 USC § 9601 et seq., 1980, “Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund),” *United States Code*, December 11, 1980.
- DOE-ID, 2004, *Idaho National Engineering and Environmental Laboratory Waste Acceptance Criteria*, DOE/ID-10381, Rev. 19, U.S. Department of Energy Idaho Operations Office, April 2004.
- ICP, 2004, *Health and Safety Plan for the Waste Area Group 10 Remedial Actions at Trinitrotoluene and Royal Demolition Explosive-Contaminated Sites*, ICP/EXT-03-00119, Rev. 0, Idaho Completion Project, June 2004.
- ICP-MCP-3475, 2004, “Temporary Storage of CERCLA-Generated Waste at the INEEL Site,” Rev. 0, *Manual 8—Environmental Protection and Compliance*, Idaho Completion Project, February 2004.
- MCP-63, 2004, “Waste Generator Services—Industrial Waste Management,” Rev. 6, *Manual 17—Waste Management*, Idaho National Engineering and Environmental Laboratory, January 2004.

Appendix D

Environmental Checklist



INTEROFFICE MEMORANDUM

Date: March 9, 2004

To: R. P. Wells MS 3950 526-2920

From: B. M. Angle *Bruce M. Angle* MS 4143 526-1841

Subject: APPROVAL OF THE REMOVAL OF TNT/RDX CONTAMINATED SOIL AT FIVE OPERABLE UNIT 10-04 SITES (INEL-03-022) ENVIRONMENTAL CHECKLIST

As INEEL's Contractor NEPA Compliance Officer, I have approved the attached EC for the proposed action. In addition, the NE-ID NEPA Compliance Officer has determined that the action is in accordance with the June 1994 Secretarial Policy on the National Environmental Policy Act. The Department of Energy will rely on the CERCLA process for review of actions taken under CERCLA. The attached EC with Approval Form is a record that should go in your project files. You may proceed with the project subject to compliance with any conditions stated in Section E of the EC and identified on the approval sheet.

Project personnel are responsible for following the most current environmental instructions found in MCP-3480. If there is a delay in beginning the project or if the project takes place over an extended time, project personnel should review MCP-3480 for the most current list of work activities and environmental instructions.

If the project description or scope changes, please notify W. T. Savkranz at 526-4858. For subsequent transmittals, reference the EC title and number (identified above).

WTS

Attachment

cc: G. W. Braun, MS 4131
S. L. Reno, MS 3515
W. T. Savkranz, MS 3211
J. A. Sherwood, MS 3950
B. M. Angle Letter File (BMA-025-04)

Uniform File Code: 6101 [INEL-03-022]

Disposition Authority: ENV2-F-3-A

Retention Schedule: Permanent. Cutoff when project is complete. Transfer to NARA 20 years after cutoff.

NOTE: Original disposition authority, retention schedule, and Uniform Filing Code applied by the sender may not be appropriate for all recipients. Make adjustments as needed.

Environmental Checklist Approval Form

EC No.: INEL-03-022

Project Title: Removal of TNT/RDX Contaminated Soil at Five Operable Unit 10-04 Sites

The undersigned agree that the information in the above-referenced document is true, accurate, and complete to the best of their knowledge. Complete any conditions listed below before initiating the proposed activity.

1. Project personnel must ensure an archaeological survey is performed prior to initiating the excavation activities. For additional information, contact Brenda Pace at 526-0916.

Program/Project Manager

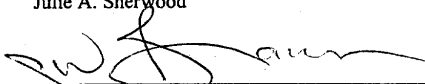


Julie A. Sherwood

2/25/04

Date

Facility Manager



Gary W. Braun

1/28/04

Date

NE-ID NEPA Compliance
Office

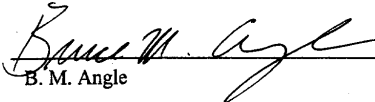

Approval Attached

Jack Depperschmidt

3/08/04

Date

Contractor NEPA Compliance
Officer



B. M. Angle

3/09/04

Date

**Jack D
Depperschmidt@Exchange**

03/08/04 12:33 PM

To: Wendy T Savkranz/WSS/CC01/INEEL/US@INEEL

cc: Roger L Twitchell@Exchange, Glenn E Nelson@Exchange, Michael J
Schultz@Exchange

Fax to:

Subject: FW: FW: INEL-03-022, Removal of TNT/RDX Contaminated Soil at Five
Operable Unit 10-04 Sites

Based on my review of the attached environmental checklist,
INEL-03-022, I have determined, as Deputy NEPA Compliance Officer,
the environmental impacts of the proposed action have been addressed
by the CERCLA process as referenced in the text of the attached
environmental checklist. Therefore, no further NEPA review is required

-----Original Message-----

From: Savkranz, Wendy T
Sent: Thursday, March 04, 2004 4:15 PM
To: Depperschmidt, Jack D
Subject: Re: FW: INEL-03-022, Removal of TNT/RDX Contaminated Soil at Five
Operable Unit 10-04 Sites

The EC has been revised to incorporate the comment
(see attached). Thanks



INEL-03-022-EC.doc
c

ENVIRONMENTAL CHECKLIST

Approved Copy

EC Document No.: INEL-03-022

DIRECTIONS: The Responsible Manager should complete Sections A through D. The Contractor's Policy and Permitting Organization completes Sections E & F (unless otherwise specified). Refer to MCP-3480 "Environmental Instructions for Facilities, Processes, Materials, and Equipment," Appendix A for instructions to complete this form.

SECTION A. Descriptive Information:

Charge Number: 1006673G0

Project Title: Removal of TNT/RDX Contaminated Soil at Five Operable Unit 10-04 Sites

DOE-HQ Program: EM-40

Project No.: 23368

Performing Organization: 3G10

Date: November 13, 2003

Contact	Name	Telephone No.	E-mail
DOE Project Technical Manager:	Glenn E. Nelson	6-0077	nelsonge
Facility Operations Manager:	Gary W. Braun	6-2830	brn
Program/Project Manager:	Julie A. Sherwood	6-9369	js9
Project/Technical Contact:	Richard P. Wells	6-2920	wellrp
Alternative Project/Technical Contact:	Kirk J. Dooley	6-2068	doo
Environmental Field Support Contact:	Scott L. Reno	6-5778	renosl

SECTION B. Project Description: Attach an accurate and concise description of the project or activity. Including type of activity (e.g., new construction, process modification, maintenance, research and development, or work for others), location (e.g., area, building, laboratory), purpose and need, project start and end dates, approximate cost.

SECTION C. Environmental Aspects / Potential Sources of Impact: Would the action involve, generate, or result in changes to any of the following? (If Yes, on attachment provide specific potential impact information such as types and amounts of chemicals, waste, effluent, or emissions; size of modification, soil disturbance; or type of tank, equipment, process, or pollution prevention measures).

Source	Yes	No	Source	Yes	No
1. Air Pollutants	X		11. Industrial Waste Generation and Management	X	
2. Asbestos Emissions		X	12. Interaction with Wildlife/Habitat	X	
3. Biological Hazards		X	13. Managing Property and Materials		X
4. Chemical Use and Storage	X		14. PCB Contamination		X
5. Contaminated Sites Disturbance	X		15. Radioactive Materials Use and Storage		X
6. Cultural/Historical Resource Disturbance	X		16. Radioactive Waste Generation and Management		X
7. Discharge to Wastewater Systems or Groundwater		X	17. Storage of Hazardous/Rad. Mat. or Waste in Tanks		X
8. Drinking Water Contamination		X	18. Surface Water and Storm Water Contamination	X	
9. Hazardous/Mixed Waste Generation and Management	X		19. Use, Reuse and Recycling of Resources		X
10. Hazardous/Rad. Material or Waste Handling and Trans.	X		20. Work within areas Subject to Flooding	X	

SECTION D. Work Activities: Select specific work activities using Appendix B in MCP-3480 and check appropriate section numbers on the Work Activity Work Sheet (see next page). Check and do one of the following:

X	If required to submit EC by MCP-3480, Appendix B, do not complete Sections E & F or Signature Block. Submit EC to environmental Management System and Employee Awareness Department, John S. Irving (MS 3428) or E-mail (JS14) for review and approval.
	If not required to submit EC by MCP-3480, Appendix B, complete Sections E & F (check either "Existing EC" or "Does not require an approved EC"), sign & date (in Signature Block), and place copy of EC in project files.

SECTION E. Instructions and Conditions: (If Yes, see attachment for instructions.)

	Yes	No
1. Instructions from MCP-3480?	X	
2. Conditions Required Before Starting Project?	X	

SECTION F. NEPA Level of Documentation and Reference(s).

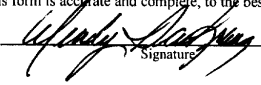
CX:	EA:	EIS:	CERCLA:	X	Previously approved NEPA document, including existing environmental checklist (provide # below):	Does not require EC approved by Environmental Affairs (e.g., routine maint., operational activities):
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Reference(s): In accordance with the June 1994 Secretarial Policy on the National Environmental Policy Act, the Department of Energy will rely on the CERCLA process for review of actions to be taken under CERCLA.

Note: For projects checked above as "CX" (Categorical Exclusion) the proposed action must not: 1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities; 3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; 4) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not "connected" nor "related" (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

Note: The above paragraph does not apply to EA, EIS, or CERCLA related activities.

SIGNATURE BLOCK. Signature indicates that this form is accurate and complete, to the best of my knowledge.

Wendy Savkranz Printed/Typed Name	 Signature	3/6/04 Date	526-4858 Telephone No.
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Highlighted Work Activities may require submittal of an Environmental Checklist to Environmental Affairs

EC Document No.: INEL-03-022

Asbestos	Performing Activities that may Break Up, Dislodge, Disturb or Block Access to Regulated Asbestos-Containing Material	Halon and Appliances Containing Halon	Tanks - Aboveground (AST) & Underground (UST) Storage Tanks
<input type="checkbox"/> 4.2	<input type="checkbox"/> Removing Asbestos-Containing Material	<input type="checkbox"/> 4.38 Maintaining, Testing and Disposing of Halon-Containing Equipment and Halon	<input type="checkbox"/> 4.60 Constructing or modifying ASTs and non-regulated USTs
<input type="checkbox"/> 4.3	<input type="checkbox"/> Removing Asbestos-Containing Material	<input type="checkbox"/> 4.39 Removing Lead from Service or from a Structure, or Classifying Newly Discovered Lead	<input type="checkbox"/> 4.61 Operating ASTs and non-regulated USTs
<input checked="" type="checkbox"/> 4.4	<input checked="" type="checkbox"/> Purchasing Chemical Products / Chemicals / Hazardous Agents	<input type="checkbox"/> 4.40 Using and Storing Product Lead	<input type="checkbox"/> 4.62 Repairing ASTs and non-regulated USTs
<input checked="" type="checkbox"/> 4.5	<input checked="" type="checkbox"/> Purchasing Chemical Products / Chemicals / Hazardous Agents	<input type="checkbox"/> 4.41 Shipping Product Lead Off-site for Direct Reuse (that is, no reclamation) at Another Facility	<input type="checkbox"/> 4.63 Changing use or reactivating ASTs and non-regulated USTs
<input type="checkbox"/> 4.6	<input type="checkbox"/> Working in a CERCLA Area of Contamination	<input type="checkbox"/> 4.42 Purchasing refrigerants, appliances containing refrigerants, system components that operate using refrigerants, or refrigerant recovery or recycling equipment	<input type="checkbox"/> 4.64 Discontinuing use of, or closing, relocating, or removing ASTs and non-regulated USTs
<input type="checkbox"/> 4.7	<input type="checkbox"/> Constructing or Modifying Facilities that Store Oil in Containers	<input type="checkbox"/> 4.43 Maintaining, servicing or repairing stationary heating, ventilation, air conditioning and refrigeration (HVACR) equipment	<input type="checkbox"/> 4.65 Constructing or modifying regulated UST systems
<input type="checkbox"/> 4.8	<input type="checkbox"/> Operating Stationary, Portable or Mobile Facilities or Equipment that Store Oil in Containers	<input type="checkbox"/> 4.44 Maintaining, servicing or repairing motor vehicle air conditioners (MVAC)	<input type="checkbox"/> 4.66 Operating and maintaining regulated USTs
<input type="checkbox"/> 4.9	<input type="checkbox"/> Constructing or Modifying Drinking Water Systems	<input type="checkbox"/> 4.45 Distributing, excessing or disposing of appliances containing refrigerants	<input type="checkbox"/> 4.67 Repairing regulated USTs
<input type="checkbox"/> 4.10	<input type="checkbox"/> Operating Drinking Water Systems	<input type="checkbox"/> 4.46 Procuring, applying and storing pesticides	<input type="checkbox"/> 4.68 Releasing, leaks, spills or unusual operating conditions from regulated USTs
<input type="checkbox"/> 4.11	<input type="checkbox"/> Sampling Drinking Water Systems	<input type="checkbox"/> 4.47 Apply fertilizers	<input type="checkbox"/> 4.69 Changing use or reactivating regulated USTs
<input type="checkbox"/> 4.12	<input type="checkbox"/> Maintaining and Repairing Drinking Water Systems	<input type="checkbox"/> 4.48 Procuring goods and services	<input type="checkbox"/> 4.70 Temporarily discontinuing use of, or temporarily dosing regulated USTs
<input type="checkbox"/> 4.13	<input type="checkbox"/> Exceeding Permitted or Regulatory Limits-Drinking Water	<input type="checkbox"/> 4.49 Leasing, renting, or transacting real property	<input type="checkbox"/> 4.71 Discontinuing use of, or closing, relocating or removing regulated USTs permanently
<input type="checkbox"/> 4.14	<input type="checkbox"/> Performing Sling Studies for New Buildings or Structures	<input type="checkbox"/> 4.50 Conducting new, or modifying existing research and development (R&D) activities, including indoor bench-scale and small-scale R&D activities, and small-scale pilot projects	<input type="checkbox"/> 4.72 Operating volatile organic storage tanks
<input type="checkbox"/> 4.15	<input type="checkbox"/> Constructing or Modifying Facilities, Equipment, or Processes	<input type="checkbox"/> 4.51 Performing routine administrative activities	<input type="checkbox"/> 4.73 Constructing or modifying facilities, equipment or processes at Permitted or interim status RCRA facilities
<input type="checkbox"/> 4.16	<input type="checkbox"/> Making Mod. to Facilities, Bldgs. or Equipment as Part of Routine Maint.	<input type="checkbox"/> 4.52 Sampling, Handling Samples and Disposing of Samples	<input type="checkbox"/> 4.74 Operating solid waste management units
<input type="checkbox"/> 4.17	<input type="checkbox"/> Operating Facilities, Equipment, or Processes	<input type="checkbox"/> 4.53 Preparing to collect CERCLA and D&D&D samples	<input type="checkbox"/> 4.75 Discontinuing use of, or closing facilities, equipment or processes at RCRA permitted or interim status units
<input checked="" type="checkbox"/> 4.18	<input checked="" type="checkbox"/> Responding to Regulatory Inspections	<input type="checkbox"/> 4.54 Collecting CERCLA & D&D&D samples	<input type="checkbox"/> 4.76 Obtaining laboratory services for EIM-funded activities
<input type="checkbox"/> 4.19	<input type="checkbox"/> Maintaining and Repairing Facilities, Processes, and Equipment	<input type="checkbox"/> 4.55 Preparing to collect samples (Non-CERCLA or D&D&D)	<input type="checkbox"/> 4.77 Procuring off-site waste management and recycling services
<input type="checkbox"/> 4.20	<input type="checkbox"/> Monitoring Storm Water according to the SWPPP for Industrial Activities	<input type="checkbox"/> 4.56 Collecting samples for analysis (Non-CERCLA or D&D&D)	<input type="checkbox"/> 4.78 Planning to generate wastes
<input type="checkbox"/> 4.21	<input type="checkbox"/> Manufacturing Wood Furniture and Wood Furniture Components	<input type="checkbox"/> 4.57 Packaging and temporarily storing samples collected to obtain environmental data	<input type="checkbox"/> 4.79 Generating waste
<input type="checkbox"/> 4.22	<input type="checkbox"/> Removing Brake Pads	<input type="checkbox"/> 4.58 Transferring samples to the laboratory	<input type="checkbox"/> 4.80 Dispositioning excess materials
<input type="checkbox"/> 4.23	<input type="checkbox"/> Maintaining Equipment Containing, or Contaminated with PCBs	<input type="checkbox"/> 4.59 Storing and maintaining samples	<input type="checkbox"/> 4.81 Constructing or modifying sewage & other wastewater systems
<input type="checkbox"/> 4.24	<input type="checkbox"/> Decontaminating Equip. Containing or Contaminated with PCBs	<input type="checkbox"/> 4.60 Reporting CERCLA and D&D&D Characterization data	<input type="checkbox"/> 4.82 Discharging new wastewaters at the INEEL Site
<input type="checkbox"/> 4.25	<input type="checkbox"/> Preparing Buildings or Facilities being Transferred to Surplus or Placed into Standby (Inactive) Status	<input type="checkbox"/> 4.61 Constructing or modifying septic tanks or systems	<input type="checkbox"/> 4.83 Discharging wastewaters to the City of Idaho Falls sewer system
<input type="checkbox"/> 4.26	<input type="checkbox"/> Reaching Bldg. or Facilities from Standby (Inactive) Status	<input type="checkbox"/> 4.62 Maintaining and repairing septic tanks or systems	<input type="checkbox"/> 4.84 Discharging wastewater to the City of Idaho Falls sewer system
<input type="checkbox"/> 4.27	<input type="checkbox"/> Decontaminating, Dismantling, or Closing Facilities (including Trailers), Equipment, and Processes	<input type="checkbox"/> 4.63 Pumping septic tanks and sanitary waste systems	<input type="checkbox"/> 4.85 Monitoring wastewater discharges to the City of Idaho Falls sewer System
<input type="checkbox"/> 4.28	<input type="checkbox"/> Relocating Portable Air Emission Sources, or Bringing Portable or Stationary Air Emission Sources onto the INEEL	<input type="checkbox"/> 4.64 Abandoning or closing septic tanks	<input type="checkbox"/> 4.86 Exceeding wastewater discharge limits to the City of Idaho Falls sewer System
<input type="checkbox"/> 4.29	<input type="checkbox"/> Constructing or Modifying Stationary Air Emission Sources	<input type="checkbox"/> 4.65 Disturbing Soil or Altering Stream Channels	<input type="checkbox"/> 4.87 Discharging new wastewaters at the INEEL Site
<input type="checkbox"/> 4.30	<input type="checkbox"/> Starting Up, Shutting Down, or Performing Scheduled Maintenance on Stationary Air Emissions Sources	<input type="checkbox"/> 4.66 Disrupting soils or altering stream channels	<input type="checkbox"/> 4.88 Discharging wastewaters to wastewater land application facilities
<input type="checkbox"/> 4.31	<input type="checkbox"/> Operating Stationary Facilities and Equipment that Emit Air Pollutants	<input type="checkbox"/> 4.67 Reporting or modifying septic tanks or systems	<input type="checkbox"/> 4.89 Operating wastewater land application facilities
<input type="checkbox"/> 4.32	<input type="checkbox"/> Operating Stationary Facilities, Processes and Equipment that Emit Radionuclides	<input type="checkbox"/> 4.68 Reporting and cleaning up spills and releases	<input type="checkbox"/> 4.90 Reporting Water Consumption
<input type="checkbox"/> 4.33	<input type="checkbox"/> Exceeding Permitted or Regulatory Limits from Stationary Air Emission Sources	<input type="checkbox"/> 4.69 Oil Spills that cannot be cleaned up within 24 hours	<input type="checkbox"/> 4.91 Constructing or Modifying Water Wells
<input checked="" type="checkbox"/> 4.34	<input checked="" type="checkbox"/> Performing Activities with the Potential for Fugitive Dust or Fugitive Emissions	<input type="checkbox"/> 4.70 Cleaning up spills and releases of PCBs	<input type="checkbox"/> 4.92 Protecting Wells
<input type="checkbox"/> 4.35	<input type="checkbox"/> Conducting Open Burning	<input type="checkbox"/> 4.71 Reporting and cleaning up spills and releases	<input type="checkbox"/> 4.93 Closing and Abandoning Wells and Boreholes
<input type="checkbox"/> 4.36	<input type="checkbox"/> Purchasing Diesel Fuel	<input type="checkbox"/> 4.72 Reporting and cleaning up spills and releases	<input type="checkbox"/> 4.94 Constructing or Modifying Injection Wells
<input type="checkbox"/> 4.37	<input type="checkbox"/> Maintaining and Repairing Motor Vehicle Gasoline Station Pump	<input type="checkbox"/> 4.73 Cleaning up spills and releases of PCBs	<input type="checkbox"/> 4.95 Operating or Sampling Permitted Injection Wells
			<input type="checkbox"/> 4.96 Operating Shallow Injection Wells Not Requiring a Permit Closing or Abandoning Injection Wells
			<input type="checkbox"/> 4.97

Environmental Checklist Attachments

Section B. Project Description (continued): Attach an accurate and concise description of the project or action. Including type of action (e.g., new construction, process modification, maintenance, new activity, research and development, or work for others), purpose and need, pollution prevention and waste minimization measures, projected start and end dates, and approximate cost.

The proposed action will remediate five contaminated soil sites as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial action for Operable Unit (OU) 10-04. The soils at the five sites are contaminated with trinitrotoluene (TNT)/cyclotrimethylene trinitramine (RDX). TNT and RDX fragments will be segregated and treated by detonation. As a CERCLA action, this project must meet the substantive requirements of applicable regulations as listed in the related OU 10-04 Record of Decision. The regulatory requirements are referred to as Applicable or Relevant and Appropriate Requirements (ARARs) and may include State of Idaho and Federal requirements.

The five contaminated sites include the fire station II zone & range fire burn area, experiment field station, land mine fuse burn area, National Oceanic and Atmospheric Administration grid, and the Naval Ordnance Disposal Area. Remediation of the TNT/RDX contaminated soil sites will include the following activities:

- Excavate approximately 800 cubic yards of soil contaminated with concentrations in excess of the remediation goals by hand unless it is determined that mechanical excavation equipment can be used. If needed, unexploded ordnances (UXO) will be removed, to proceed with soil excavation. Otherwise, UXO removal will be performed during remediation of the ordnance areas.
- Manually segregate fragments of TNT/RDX from the soil unless the safety assessment indicates it is safe to mechanically screen the soil.
- Dispose of the TNT/RDX fragments by detonation at the Mass Detonation Area (MDA), which is located north of INTEC and southeast of NRF.
- Sample and analyze removed soil to determine the TNT and RDX concentrations and if the soil exhibits any RCRA hazardous waste characteristics.
- Backfill and revegetate areas excavated to depths greater than 0.3 m (1 ft) with uncontaminated soil or contour to match the surrounding terrain.

The project will be performed in 2007. The estimated cost to perform the remedial action is \$220,000.

Section C. Environmental Aspects (continued): (If you answered Yes to any Section C items, label with Section C Item Number and explain below.)

1. Air Pollutants - The proposed project will generate fugitive dust emissions from excavation if mechanical equipment is used. Fugitive emissions will also be generated from detonation activities. Water and/or soil fixatives will be used to stabilize disturbed areas, stockpiled materials, etc. Work in disturbed areas will be re-evaluated if sustained winds of 25 mph are present at the task site. Work will be stopped if excessive blowing dust is observed, regardless of the wind speed, and the dust hazard will then be mitigated by physical means.

4. Chemical Use and Storage - Blasting caps containing small amounts of PET and RDX, fertilizers, fuels, and decontamination solutions may be used in support of the proposed action. Project personnel will use non-hazardous chemical substitutes in the place of hazardous chemicals as long as the non-hazardous substitutes meet the requirements/specifications of the requester. Spill prevention/minimization measures will be employed during storage and use of chemicals/fuels. Affirmative Procurement (MCP-1185) will be used as guidance in procuring applicable chemicals and materials.

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EC Document No.: INEL-03-022

5. Contaminated Sites Disturbance - The project activities will disturb some existing vegetation and topsoil at the five OU 10-04 CERCLA sites.

6. Cultural / Historical Resource Disturbance - The TNT/RDX sites were partially surveyed (Attachment 1). However, once specific cleanup sites within the areas have been defined and targeted for cleanup activities, archaeological surveys and/or archaeological monitoring will be conducted to ensure that no adverse effects occur (see Section E., Conditions, #1).

9. Hazardous / Mixed Waste Generation - The segregated TNT/RDX is considered hazardous waste and will be managed accordingly. The TNT/RDX will be segregated and detonated at the MDA, which is expected to consume the hazardous constituents. If the remaining soil contains less than 10% TNT and RDX and no RCRA constituents, it will be disposed at an approved offsite landfill. Otherwise, the soil will be transported to a permitted RCRA facility for thermal treatment and disposal.

10. Hazardous/Radioactive Material and Waste Handling and Transportation - A hazardous waste determination will be performed for all waste streams to develop the appropriate management practices. Waste streams will be evaluated to determine if any of these materials can be recycled or reused and will be evaluated to implement actions for minimizing waste entering the landfill.

11. Industrial Waste Generation - The estimated quantity of industrial waste is unknown at this time, but is anticipated to be small and to include materials used to clean hydraulic spills, personal protection equipment (PPE), and other miscellaneous waste. All industrial waste will be disposed of in the INEEL Landfill Complex.

12. Interaction with Wildlife/Habitat - The proposed action will be performed outside facility boundaries and therefore, a biological evaluation was conducted and clearance granted (Attachment 2). However, the clearance includes several recommendations that should be adhered to if possible. One recommendation, preparation of a revegetation and weed management plan, will be complied with if the soil disturbance meets the criteria identified in the evaluation.

The sites (approximately 5 acres) will be restored in accordance with the Remedial Design/Remedial Action Work Plan per INEEL revegetation procedures.

18. Surface Water and Storm Water Contamination - The five TNT/RDX sites are located within the storm water corridor near the Big Lost River channel. Excavation of soil will occur as part of this project. A Project specific Storm Water Pollution Prevention Plan for Construction Activities has been approved for the proposed action (Attachment 3).

20. Work within areas Subject to Flooding - The five TNT/RDX sites are located near the Big Lost River channel. Portions of the TNT/RDX sites are within the hypothetical 100-year floodplain of the Big Lost River as described in the report "Flood Routing Analysis for a Failure of Mackay Dam," EGG-EP-7184, by Koslow and Van Haaften, 1986. The activities are not expected to have a significant impact on the floodplain. Displacement of earthen materials by excavation or detonations for this project are not expected to disrupt Big Lost River floodplain dimensions, elevations, flow volumes, or velocities. If the hypothetical flood was to occur, access to the work areas may be temporarily interrupted.

Section E. Conditions and Instructions: (Include conditions required before starting project and select applicable Work Activity Instructions from MCP-3480)

Conditions:

1. Project personnel must ensure an archaeological survey is performed prior to initiating the excavation activities. For additional information, contact Brenda Pace at 526-0916.

Instructions:

The Management Control Procedure - 3480 "Environmental Instructions for Facilities, Processes, Materials, and Equipment" provides the environmental instructions for this proposed activity based on the work activities identified in Section D (page 2). Refer to the following sections in MCP-3480 for the appropriate environmental instructions:

ENVIRONMENTAL CHECKLIST
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- 4.4 Purchasing Chemical Products / Chemicals / Hazardous Agents
- 4.5 Using, Storing and Dispositioning Chemical Products / Chemicals / Hazardous Agents
- 4.6 Working in a CERCLA Area of Contamination
- 4.17 Operating Facilities, Equipment, or Processes
- 4.34 Performing Activities with the Potential for Fugitive Dust or Fugitive Emissions
- 4.47 Applying Fertilizers
- 4.48 Procuring Goods and Services
- 4.57 Disturbing Soils or Altering Stream Channels
- 4.76 Obtaining Laboratory Services for EM-Funded Activities
- 4.77 Procuring Off-Site Waste Management and Recycling Services
- 4.78 Planning to Generate Waste
- 4.79 Generating Waste
- 4.98 Preparing to collect CERCLA or D&D&D Samples
- 4.99 Collecting CERCLA and D&D&D Samples
- 4.102 Packaging and Temporarily Storing Samples Collected to Obtain Environmental Data
- 4.103 Transferring Samples to a Laboratory
- 4.104 Storing and Maintaining Samples
- 4.105 Disposing of samples
- 4.106 Reporting CERCLA and D&D&D Characterization Data

Attachment 4 contains the applicable or relevant and appropriate requirements (ARARs) identified for this project. The following were not identified as ARARs.

Work Activities

- 4.47, 4.48, 4.57, 4.98, 4.99, 4.102, 4.103, 4.104, 4.105 and 4.106

Environmental Aspects

- 12, 18, and 20

Non-CERCLA NEPA Commitments – To incorporate NEPA values into the CERCLA process, BBWI will follow the requirements identified in this Environmental Checklist as best management practices.

Section F. NEPA Level of Documentation and Reference(s): In accordance with the June 1994 Secretarial Policy on the National Environmental Policy Act, the Department of Energy would rely on the CERCLA Process for review of actions to be taken under CERCLA. The proposed activity supports a CERCLA action and does not support the siting, construction, or operation of a treatment, storage, or disposal facility for waste management or other purposes unrelated to CERCLA. The CERCLA documents for this activity have incorporated NEPA values to the extent practicable and the CERCLA documents will be made available to the public in accordance with the requirements of CERCLA.



Brenda R Pace

10/30/03 10:58 AM

To: Deborah W Wagoner/WIGG/CC01/INEEL/US@INEL

cc: Richard P Wells/WELLRP/CC01/INEEL/US@INEL, Wendy T Savkranz/WSS/CC01/INEEL/US@INEL

Fax to:

Subject: Archaeological review of 5 TNT/RDX sites

Hi Deborah, thank you for providing information on the current boundaries of TNT/RDX areas within WAG 10. I have reviewed my archives to determine the extent of archaeological survey coverage within each area and summarize my findings briefly below.

- **Fire Station II Zone & Range Fire Burn Area:** Most of this area was surveyed for archaeological resources in 1997. A small portion including the northern 1/2 of what is shown as "Area 1" remains unsurveyed. Three archaeological resources were identified during the 1997 surveys; all are located in "Area 2."
- **Experimental Field Station:** This area was partially surveyed for archaeological resources in 1997. The southeastern half, including "Area 2" remains unsurveyed. No archaeological resources were identified in the portion of this area that was surveyed in 1997.
- **Land Mine Fuze Burn Area:** Nearly all of this area was surveyed for archaeological resources in 1996. Only one small square that extends to the southwest of the main area remains unsurveyed. Two archaeological resources were identified in the main area in 1996.
- **National Oceanic and Atmospheric Administration Grid:** Archaeological surveys of this area were completed in 1997. None of the area as it is currently defined is unsurveyed. Five archaeological resources were identified during the 1997 surveys and nearly all are located in the northernmost area, designated as "Area 1." "Area 4" also contains one resource.
- **Naval Ordnance Disposal Area:** The first archaeological surveys of this area were completed in 1984 and 1985. Survey coverage was expanded in 1994 and 1997. The northern 1/3 of the area as it is currently defined remains unsurveyed. This includes a zone adjacent to the Big Lost River that is likely to contain additional archaeological sites. In the surveyed portion of the area archaeological sites are numerous. Twelve have been identified. Many of these are located along the western border of the area.

I understand that the currently proposed actions at these areas include modest ground disturbance associated with removal of TNT/RDX fragments and contaminated soil. It is anticipated that all removal activities will be conducted by hand and will probably affect 5 acres or less. Once specific cleanup sites within the areas described above have been defined and targeted for cleanup activities, archaeological surveys and/or archaeological monitoring can be conducted to ensure that no adverse effects occur. In accordance with DOE-ID's Agreement in Principle with the Shoshone-Bannock Tribes, designated tribal representatives will also be invited to visit the areas once they are delineated. The Environmental Checklist for this project should include provisions for these pre-cleanup surveys and/or archaeological monitoring of any activities that fall within the boundaries of previously identified archaeological resources.

I look forward to our tour of the project areas on November 11. Please don't hesitate to give me a call if you have any questions or concerns. --Brenda

Brenda Ringe Pace
Registered Professional Archaeologist
Idaho National Engineering and Environmental Laboratory
P.O. Box 1625-2105
Idaho Falls, ID 83415



December 19, 2003

Mr. Roger L. Twitchell
NEPA Compliance Officer
U. S. Department of Energy
Idaho Operations Office
850 Energy Drive, MS 1216
Idaho Falls, ID 83401-1563

Subject: Remediation of Five TNT/RDX Contaminated Soil Sites

Dear Mr. Twitchell:

This letter provides recommendations in support of NEPA for activities related to the remediation of five TNT/RDX contaminated soil sites as part of the remedial action for Operable Unit 10-04.

The NODA area contains both disturbed and undisturbed soils. Much of this site burned in 2000 and is in the process of recovering. The soils in the area are very fine and contain macrobiotic crusts in some places. The current vegetation in the area is comprised of native and non-native vegetation such as Indian ricegrass, bluebunch wheatgrass, green rabbitbrush, Russian thistle, and cheatgrass.

Soils on the the NOAA Grid area are both disturbed and undisturbed and range from very fine to cobble. Vegetation in the area consists of both native and non-native species such as crested wheatgrass, sagebrush, green rabbitbrush, gray horsebrush, bluebunch wheatgrass, phlox, and prickly pear cactus. Along the roads that intersect this area, non-native species such as Russian thistle, halogeton, and kochia are present.

The Land Mine Fuse Burn area also consists of both disturbed and undisturbed soils that range from very fine to cobble. Portions of this site burned during the 2000 fire season. Vegetation consists of crested wheatgrass dominating areas that have previously disturbed and sagebrush and green rabbitbrush in undisturbed areas. Other vegetation species in this area are western wheatgrass, needle and thread grass, phlox, and prickly-ear cactus.

The Fire Station II Zone and Range Fire Burn Area soils range from very fine to cobble and have been both disturbed and undisturbed. Crested wheatgrass dominates areas that have been previously disturbed and sagebrush areas that are undisturbed. Other vegetative species in the area are green rabbitbrush, phlox, western wheatgrass, tapertip hawksbeard, and prickly pear cactus.

The Experimental Field Station area contains both disturbed and undisturbed soils. Vegetation in the area consists of sagebrush, Indian ricegrass, crested wheatgrass, phlox, and prickly-pear cactus.

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The described activities do not mention the removal of vegetation. If vegetation removal is required ESER ecologists recommend mowing as the method to remove vegetation. Mowing has proven useful in clearing the shrubs to allow access, while at the same time minimizing reseeding costs and reducing the possibility of exotic species to become established.

We also recommend that if remediation requires mechanical excavation or if the excavation of soil is larger than 100² ft or has a 10.0 ft diameter a revegetation and weed management plan be developed and approved. Areas of disturbance should be replanted to native species as soon as ecologically possible. ESER ecologists can provide assistance to the project manager in selecting appropriate species and seeding rates. To reduce the costs and regulatory liabilities associated with revegetation, the size of the area of soil disturbance should be kept as small as possible and support vehicles and equipment should use existing road shoulders as much as possible for turning and parking.

All areas may be used by a diverse complement of small mammals, reptiles, and breeding bird species common to the sagebrush steppe. Some former Candidate species for listing as Threatened or Endangered (e.g., sage grouse, pygmy rabbit, ferruginous hawk, loggerhead shrike and sagebrush lizard) are known to use these general areas.

There are no known federally listed or proposed threatened or endangered species, or records thereof, or designated critical habitat in proximity to the project area, the area of construction of storm water pollution prevention measures, the areas where storm water flows from the project area to the point of discharge, or in proximity to the area where storm water discharges into receiving waters. Therefore, a biological consultation with the U.S. Fish and Wildlife Service is not necessary for these activities.

It is unlikely the proposed activities will have any measurable long-term impact on any species in these areas including those of federal or state concern. Short-term impacts will include temporary removal and disturbance of habitat for some species. Some noise impacts may occur but are expected to be minimal. Increased mortality due to vehicle activity in these areas is expected but not anticipated to be significant.

If you have any questions regarding this evaluation, please contact me at phone number below or at svilord@stoller.com.

Sincerely,

Sue J. Vilord
Wildlife Biologist
Environmental, Surveillance, Education and
Research Program
Stoller Corp.
1780 First Street,
Idaho Falls, ID 83401
(208) 525-9358
FAX: (208) 525 -3364

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**PROJECT STORM WATER POLLUTION PREVENTION PLAN
FOR CONSTRUCTION ACTIVITIES (SWPPP-CA)**

PROJECT TITLE: Removal of TNT/RDX Soil at 5 OU 10-04 Sites

Facility or Location: INEEL outside facility fences

Environmental Checklist No.: _____

Project Description:

The proposed project will remediate five TNT/RDX contaminated soil sites as part of the CERCLA remedial action for Operable Unit 10-04. Soil and TNT and RDX fragments will be removed. TNT and RDX fragments will be segregated and treated by detonation on the INEEL. The rest of the contaminated soil will be disposed on or off the INEEL but not treated. Remediation of the TNT/RDX contaminated soil sites will include the following activities:

Project Construction Date/Duration: 2007

Area of Site to be disturbed: 5 Acres

INEEL SWPPP-CA Section 4.2.11

Sequence: Describe the sequence of major activities, implementation of controls, and removal of controls.

1.) Excavate soil contaminated with concentrations in excess of the remediation goals by hand unless it is determined that mechanical excavation equipment can be used (approximately 7300 yd³). UXO will be removed, if required, to proceed with soil excavation. Otherwise UXO removal will be performed during remediation of the ordnance areas.

2.) Manually segregate fragments of TNT/RDX from the soil unless safety assessment indicates it is safe to mechanically screen the soil.

3.) Dispose of the TNT/RDX fragments by detonation at the Mass Detonation Area (MDA).

4.) Backfill areas excavated to depths greater than 0.3 m (1 ft) with uncontaminated soil or contour to match the surrounding terrain

5.) Re-vegetate in accordance with the RD/RA Work Plan.

Controls will be sequenced in accordance with section 4.2.11 of INEEL SWPPP.

INEEL SWPPP-CA Section 4.2.6

Erosion and Sediment Control: Describe controls to minimize soil disturbance, divert storm water from exposed soil, achieve maximum pollutant removal, minimize offsite vehicle tracking of sediment, and minimize the generation of dust. Identify entity responsible for implementation and maintenance.

Erosion sediment controls will be implemented by 1.) temporarily creating sediment basins as part of excavation, and 2.) re-vegetating in accordance with the RD/RA Work Plan.

INEEL SWPPP-CA Section 4.2.8.5

Support Activities: Identify industrial sources of pollutants such as asphalt and concrete plants and describe controls.

Not applicable

INEEL SWPPP-CA Section 4.2.8.4

Allowable Non-Storm Water Discharge: Identify type of discharge and describe controls.

No non-storm water discharges are anticipated.

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PROJECT STORM WATER POLLUTION PREVENTION PLAN FOR CONSTRUCTION ACTIVITIES (SWPPP-CA)

INEEL SWPPP-CA Section 4.2.8

Material and Waste Management: Identify construction materials and wastes and describe controls to reduce pollutants and prevent discharge of materials and wastes.

No materials are anticipated to be stored on the site. Spills will be managed in accordance with INEEL spill procedures.

INEEL SWPPP-CA Section 4.2.7

Permanent Storm Water Management: Describe controls that will be installed during construction to control pollutants in storm water discharges after construction has been completed.

No structural controls will be implemented. the excavations will create shallow sedimentation basins. No soil piles will be stored on site.

INEEL SWPPP-CA Section 4.2.6

Temporary Soil Stabilization: Identify temporary soil stabilization measures and describe scheduling. Identify the entity responsible for implementation and maintenance. For vegetative stabilization measures, describe project turnover and vegetation monitoring.

Not applicable.

INEEL SWPPP-CA Section 4.2.15

Final Soil Stabilization: Identify soil stabilization measures and describe scheduling. Identify the entity responsible for implementation and maintenance. For vegetative stabilization measures, describe project turnover and vegetation monitoring.

If institutional controls are required, the Operation and Maintenance Plan for this CERCLA activity will monitor and maintain re-vegetation in accordance with the Plan. If institutional controls are not required, re-vegetation monitoring and maintenance will done by the re-vegetation coordinator for the Balance of INEEL Project.

INEEL SWPPP-CA Section 4.2.4

Endangered Species: Identify listed species or critical habitat in proximity to the construction activity. Describe any adverse impact and mitigation measures.

See attached biological survey results.

NOTE:

1. See the INEEL SWPPP-CA (DOE/ID-10425) for guidance.
2. **Attach a general location map.** Indicate the location of the construction site, location of potential pollutant sources located away from the construction site (storage areas, asphalt or concrete mix plants, etc.), and components of the Big Lost River System within 1 mile of the construction site. INEEL SWPPP-CA Section 4.2.2.
3. **Attach a site map.** Show the entire construction site, indicate drainage patterns, slopes, components of the Big Lost River System, locations of discharge(s), locations of potential pollutant sources on the construction site (equipment, waste, and material storage areas including soil piles), areas of soil disturbance, locations where soil will not be disturbed, erosion and sediment controls, stabilized entrances, existing and proposed storm water controls, and locations of soil stabilization. INEEL SWPPP-CA Section 4.2.2.
4. **Make this project SWPPP-CA available at the construction site.** INEEL SWPPP-CA Section 4.1.
5. **Perform inspections** (Form 450.12) INEEL SWPPP-CA Section 4.2.14.
6. **Perform maintenance and implement corrective actions.** INEEL SWPPP-CA Sections 4.2.9 and 4.2.14.2.
7. **Record progress and delay** (Form 450.26). INEEL SWPPP-CA Section 4.2.12.
8. **Revise this document as required.** INEEL SWPPP-CA Section 4.2.13.

I have evaluated and identified controls adequate to meet the requirements of the INEEL Storm Water Pollution Prevention Plan for Construction Activities.

Project Manager

Signature

Date

Name (Please Print)

Phone Number

I am in agreement with the provisions set forth in this plan.

INEEL SWPPP Coordinator:

Ken Milbrink

Date: 12/22/03

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**PROJECT STORM WATER POLLUTION PREVENTION PLAN
FOR CONSTRUCTION ACTIVITIES (SWPPP-CA)**

CERTIFICATION:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based upon my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: _____ Date: _____

Title:

For:

Reference: Transfer Signature Authority Letter – PHD-34-00

Signature: _____ Date: _____

Title: Environmental Technical Support Division Director

For: DOE-Idaho Operations Office

Reference: Transfer Signature Authority Letter – OPE-EP&SA-98-091

Project SWPPP-CA must be appended to the INEEL SWPPP-CA.

ARARs and To Be Considered(TBC)s for OU 10-04 TNT/RDX Contaminated Soil Sites Remedial Action

Category	Citation	Reason	Relevancy ^a
Chemical-specific applicable, relevant, and appropriate requirements (ARARs)			
Idaho Ground Water Quality Rule	IDAPA 58.01.11.200	TNT/RDX leaching from the site must not adversely affect groundwater quality; standards for groundwater quality must be met.	A
Action-specific ARARs			
Rules for the Control of Air Pollution in Idaho	Fugitive Dust IDAPA 58.01.01.650 and .651	Requires control of dust at all times, especially during excavation of the soil.	A
Resource Conservation and Recovery Act – Standards Applicable to Generators of Hazardous Waste	Hazardous Waste Determination IDAPA 58.01.05.006 (40 CFR 262.11)	A RCRA hazardous waste determination is required for the TNT/RDX fragments, any recovered UXO, excavated soil, and other secondary waste generated during remediation, which is to be treated or disposed of on or off the INEEL.	A
Resource Conservation and Recovery Act – Standards Applicable to Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Units	General Facility Standards for Owners and Operators of Remediation Waste Management Sites IDAPA 58.01.05.008 (40 CFR 264.1[j][1-13])	General RCRA performance standards must be met during remediation.	A
	Equipment Decontamination IDAPA 58.01.05.008 (40 CFR 264.114)	All equipment used during remediation that contact hazardous waste must be decontaminated in accordance with RCRA requirements.	A
	Use and Management of Containers IDAPA 58.01.05.008 (40 CFR 264.171-177)	Hazardous waste generated during remediation that is managed in containers must meet RCRA requirements.	A
	Open Burning, Waste Explosives IDAPA 58.01.05.008 (40 CFR 265.382)	Detonation of TNT/RDX fragments and UXO must be performed in a manner that does not threaten human health or the environment.	A

ARARs and To Be Considered(TBC)s for OU 10-04 TNT/RDX Contaminated Soil Sites Remedial Action

Category	Citation	Reason	Relevancy ^a
Resource Conservation and Recovery Act – Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities	Military Munitions Rule 40 CFR 266.205 and 206	TNT/RDX fragments and UXO identified as hazardous waste under RCRA must meet RCRA requirements for storage, if required during remediation on an interim basis, and transport. Any emergency response conducted during remediation involving munitions or explosives will be exempt from RCRA waste generator and transporter requirements.	A
Location Specific ARARs			
National Historic Preservation Act	Historic properties owned or controlled by Federal agencies 16 USC 470 h-2 Identifying Historic Properties 36 CFR 800.4 Assessing Effects 36 CFR 800.5	In accordance with federal requirements, the site must be surveyed for cultural and archeological resources before construction and appropriate actions must be taken to protect any sensitive resources.	A
Native American Graves Protection and Repatriation Act	Custody 25 USC 3002 (43 CFR 10.6) Repatriation 25 USC 3005 (43 CFR 10.10)	In accordance with federal requirements, the site must be surveyed for cultural and archeological resources before construction and appropriate actions must be taken to protect any sensitive resources.	A
TBC			
Real Property Contaminated with Munitions, Explosives, or Chemical Agents	DoD Standard 6-55.9, Chapter 12	Establishes requirements for disposition of real property known or suspected to be contaminated with ammunition, explosives, or chemical agents.	

a. A = Applicable; RA = Relevant and Appropriate

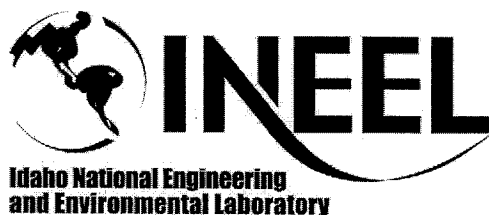
Attachment 1

Construction Specification

Construction Specification

PROJECT NO. 23368

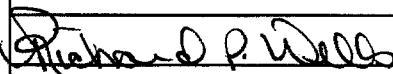
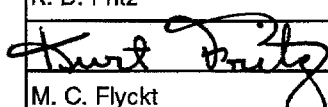
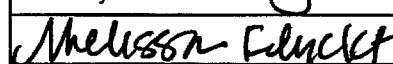
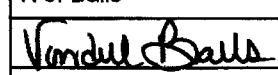
Construction Specification: Remedial Design/Remedial Action Work Plan for the Operable Units 6-05 and 10-04, Phase II

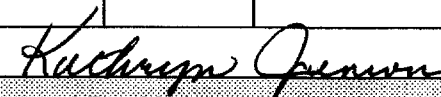


DOCUMENT MANAGEMENT CONTROL SYSTEM (DMCS)
DOCUMENT APPROVAL SHEET

1. Document Identifier: SPC-585 2. Project File No. (optional): 23368 3. Revision No.: 0
Construction Specification: Remedial Design/Remedial Action Work Plan for the Operable Units 6-05 and 10-04, Phase II
4. Document Title: 04, Phase II
5. Comments: _____

6. Type or Printed Name Signature	7. Signature Code	Date	8. Organization/ Discipline

R. P. Wells	A	8/4/04	
			Project Manager
K. D. Fritz	A	8/3/04	3K16
			Project Engineer
M. C. Flyckt	A	8/4/04	3K16
			Civil Engineer
V. J. Balls	A	8/4/04	3K16
			Civil Engineering Group Supervisor

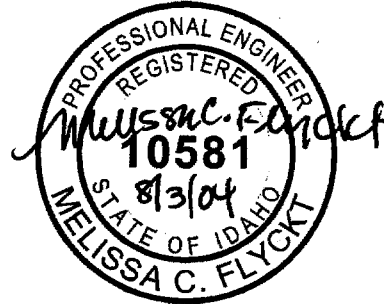
9. Document Control Release Signature:  Date: 8-3-04

RECORDS MANAGEMENT

10. Is this a Construction Specification? Yes ☒ No ☐ 11. NCR Related? Yes ☐ No ☒
12. Does document contain sensitive, unclassified information? ☐ Yes ☒ No If Yes, what category: _____
13. Can document be externally distributed? Yes ☒ No ☐
14. Area Index Code: Area _____ Type _____ SSC ID _____
15. Uniform File Code: 0250 16. Disposition Authority: ENV1-b-4-a Record Retention Period: Cutoff when superseded, obsolete or canceled. Destroy 75 years after cutoff.
17. For QA Records Classification Only: Lifetime ☐, Nonpermanent ☐, Permanent ☐
Item or activity to which the QA Records apply: _____
18. Periodic Review Frequency: N/A ☒, 5 years ☐, or Other _____

**Construction Specification: Remedial Design/Remedial Action Work Plan for the
Operable Units 6-05 and
10-04, Phase II**

The following Sections of this Specification were prepared under the direction of the Registered Professional Engineer as indicated by the seal and signature provided on this page. The Professional Engineer is registered in the State of Idaho to practice Civil Engineering.



**CONSTRUCTION SPECIFICATIONS
FOR
REMEDIAL DESIGN/REMEDIAL ACTION WORK PLAN FOR THE OPERABLE
UNITS 6-05 AND 10-04, PHASE II**

Prepared for:

**U. S. DEPARTMENT OF ENERGY
IDAHO OPERATIONS OFFICE**

Idaho Falls, Idaho

Project File No. 23368

August 2004

**BECHTEL BWXT IDAHO, LLC (BBWI)
Idaho Falls, Idaho 83415**

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CONSTRUCTION SPECIFICATION: REMEDIAL DESIGN/REMEDIAL ACTION
WORK PLAN FOR THE OPERABLE UNITS 6-05 AND 10-04, PHASE II

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Project Title: Construction Specification: Remedial Design/Remedial Action
Work Plan for the Operable Units 6-05 and 10-04, Phase II
Document Type: Construction Specification **Project Number:** 23368
SPC No. 585

SECTION 01005--SUMMARY OF WORK

PART 1--GENERAL

SUMMARY:

The Subcontractor shall furnish plant, labor, material, equipment, and supplies (except Government-furnished materials and/or equipment) and perform work and operations necessary to remediate the trinitrotoluene (TNT) and Royal Demolition Explosive (RDX) contaminated soil sites complete, in accordance with the DOE/NE-ID-11127 Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II document and these specifications. Remediation will require the removal of TNT and RDX found on the five sites within the INEEL and remediation of soils found at the sites that were contaminated with chemical compounds (principally TNT and RDX) during explosives tests. The five include the following:

- Fire Station II Zone and Range Fire Burn Area.
- Experimental Field Station
- Land Mine Fuze Burn Area
- National Oceanic and Atmospheric Administration (NOAA)
- Naval Ordnance Disposal Area (NODA).

Reference the DOE/NE-ID-11127 Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II document for the locations and descriptions of the five sites.

Section Includes, but is not limited to:

Activities for the remediation for the five contaminated sites include:

- Visual survey of the bounded areas
- Collection of fragments of TNT/RDX
- Geophysical evaluation to identify potential UXO lying under the ground surface
- Clearing of the site to be excavated
- Survey of original topography in areas requiring substantial soil collection
- Removal and disposal of stained soil
- Disposal of contaminated soil
- Testing of remediated areas for remaining soil contamination
- Re-survey of topography in areas that required substantial soil collection
- Grading of excavated areas to match surrounding topography
- Revegetation of excavated and disturbed areas.

Project Title: Construction Specification: Remedial Design/Remedial Action
Work Plan for the Operable Units 6-05 and 10-04, Phase II
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REFERENCES:

The following documents, including others referenced therein, form part of this Section to the extent designated herein.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	OSHA Occupational Safety and Health Standards
29 CFR 1926	OSHA Health and Safety Standards for Construction

BECHTEL BWXT IDAHO, LLC (BBWI)

DOE/NE-ID-11127	Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II
PROC-185	General Provisions for Fixed Price Construction Subcontracts
SRM	Subcontractor Requirements Manual

Unless otherwise specified, references in these specifications, codes, standards or manuals that are part of these specifications, but not included herein, shall be the latest edition, including any amendments and revisions, in effect as of the date of this Specification.

SUBMITTALS:

Submittals include, but are not limited to the following:

Hazardous Chemicals and Substances: Subcontractor shall submit a list of hazardous chemicals and substances in accordance with General Provisions for mandatory approval. Chemicals and substances not previously approved for use will require the submittal of MSDS for mandatory approval.

QUALITY ASSURANCE:

Quality Assurance Program requirements shall exist to assure that work performed is in conformance with the requirements established by the drawings and this specification. QA Program criteria applicable to this scope of work is addressed in the Special Conditions, BBWI Subcontractor Requirements Manual, General Provisions, and these specifications.

SAFETY, HEALTH AND ENVIRONMENT:

In general work shall be in compliance with the applicable sections of 29 CFR 1910, 29 CFR 1926 and the BBWI Subcontractor Requirements Manual.

END OF SECTION 01005

Project Title: Construction Specification: Remedial Design/Remedial Action
Work Plan for the Operable Units 6-05 and 10-04, Phase II
Document Type: Construction Specification **Project Number:** 23368
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1 SECTION 01051--CONSTRUCTION SURVEYING AND STAKING

2
3 PART 1--GENERAL

4
5 SUMMARY:

6
7 Section Includes: Work includes, but is not limited to:

8
9 The Subcontractor shall furnish all materials, labor, tools and equipment to perform
10 all surveying necessary to lay out and control the construction work. The
11 Subcontractor shall perform surveying to establish excavation boundaries as set forth
12 in these specifications and the DOE/NE-ID-11127 Remedial Design/Remedial Action
13 Work Plan. Following visual screening of the contamination, the Contractor will
14 provide survey coordinates for the excavation boundary as required. The
15 Subcontractor shall then survey and mark the excavation boundary prior to
16 commencement of selective excavation. See Section 02200 for definition of
17 excavation terms.

18
19 SUBMITTALS:

20
21 Submittals include but are not limited to the following:

22
23 Certification: Submit certification that the land surveyor is a registered professional in the
24 State of Idaho.

25
26 Topographical Survey: Electronic data shall be reduced and plotted by the Subcontractor in
27 standard ASCII and AutoCAD 14 format. Electronic data shall be submitted on electronic
28 media such as CD or Zip Disk. Legible notes, drawings, and electronic data files (including
29 point number, northing, easting, elevation, and point description) shall be submitted to the
30 Contractor for approval. All surveys shall be conducted using the established project datum.
31 Required surveys shall consist of:

- 32
33 1) Topographical survey of the original topography and final excavated surface
34 (prior to backfilling) of excavation sites including all disturbed areas and a
35 topographical map of the area with a contour interval of 1-foot. At a
36 minimum, the topographic survey shall include all breaks in grade, swales,
37 and other natural features with sufficient detail to accurately model the
38 disturbed surface. In areas where the terrain is relatively flat, a grid of no
39 greater than 50-ft in all directions shall be used
40 2) Topographical survey of the final backfilled surface for the two noted
41 concentrated areas of excavation including all areas that required backfilling.
42 A topographical map of each area shall be submitted with a contour interval of
43 1-foot. Survey shall include all breaks in grade and of sufficient grid to
44 accurately model the disturbed surface.
45

Project Title: Construction Specification: Remedial Design/Remedial Action
Document Type: Work Plan for the Operable Units 6-05 and 10-04, Phase II
SPC No. Construction Specification **Project Number:** 23368
585

The topographic surveys will be used to calculate compacted in-place backfill quantities as well as revegetation areas.

See Section 01300, Submittal and Vendor Data Schedule for additional requirements.

QUALITY CONTROL:

Qualifications: Construction surveying and staking shall be accomplished under the direction of a registered professional land surveyor.

PART 2--PRODUCTS

Stakes: Identification stakes and hubs shall be of sufficient length, width and depth to provide a solid set in the ground and to provide space for marking above ground when applicable. The top 2-in. of all stakes shall be painted or marked with plastic flagging.

PART 3--EXECUTION

SURVEY REQUIREMENT:

Control: Use existing control as required. The coordinates of the existing controls will be provided by the Contractor. Prior to commencement of construction work, the Subcontractor shall establish survey control inside the work area.

Project Datum: Horizontal coordinates are based on NAD27 Idaho East Zone State Plane. All surveying for the project construction shall be based on this datum. Vertical datum shall be NGVD29.

Excavation Limit Reference Stakes: Excavation limit stakes shall be established. The position of these stakes shall be determined by methods that will produce precision level C shown on Table 1.

The clearing limit shall be located on the ground and marked with lath, flagging, or other methods approved by the Contractor's Representative.

TABLE 1. CROSS SECTION AND SLOPE-STAKE PRECISION

Item	Precision		
	A	B	C
Horizontal accuracy for clearing limits. In feet or percentage of horizontal distance measured from transverse line, whichever is greater	0.05-ft or 0.2%	0.15-ft or 0.6%	0.2-ft or 1.0%

Project Title: Construction Specification: Remedial Design/Remedial Action
Work Plan for the Operable Units 6-05 and 10-04, Phase II
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Monuments of Property Boundaries or Surveys of Other Agencies: If property boundary or survey monuments, or survey markers of other agencies, are found within or adjacent to the construction limits, the Subcontractor shall immediately notify the Contractor's Representative. These monuments shall not be disturbed.

METHOD OF MEASUREMENT:

Surveying: Surveying will not be measured.

BASIS OF PAYMENT:

Surveying: Payment for surveying shall be included in the contract unit price for excavation.

FIELD QUALITY CONTROL:

Surveillance will be performed by the Contractor's Representative to verify compliance of the work to the drawings and specifications.

END OF SECTION 01051

Project Title: Construction Specification: Remedial Design/Remedial Action
Work Plan for the Operable Units 6-05 and 10-04, Phase II
Document Type: Construction Specification **Project Number:** 23368
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1 SECTION 01300--SUBMITTALS

2
3 PART 1--GENERAL

4
5 SUMMARY:

6
7 This section specifies the administrative, technical and quality requirements for vendor data
8 submittals. Vendor data requirements are specified in individual specification sections or on
9 the drawings, and tabularized on a Vendor Data Schedule. In the event of conflicting
10 requirements, the submittal requirements prescribed in the individual specification section
11 shall take top priority, the drawings second and the vendor data schedule last.

12
13 The Subcontractor shall submit data, drawings, and other submittals specified. If the
14 Contractor determines the Subcontractor's submittal to be incomplete or unacceptable, the
15 Subcontractor shall make a complete and acceptable submittal to the Contractor by the
16 second submission of a submittal item.

17
18 The Subcontractor shall be responsible for providing submittals in accordance with the
19 Subcontract General Provisions Document, providing submittals with adequate time for
20 review and resubmittal, and advising the Contractor of any submittal that may be delayed and
21 which might, if further delayed, extend completion of the project.

22
23 Section Includes, but is not limited to:

24
25 The preparation, transmittal and delivery of documents by the Subcontractor to the
26 Contractor as required in the "Submittals" subdivision of the specification sections
27 and as provided on the Vendor Data Schedule.

28
29 Related Sections: General Provisions, Subcontractor Requirements Manual, Special
30 Conditions, Drawings, Vendor Data Schedule, and other sections of these specifications
31 apply to this section.

32
33 REFERENCES:

34
35 The following documents, including others referenced therein, form part of this Section to
36 the extent designated herein:

37
38 AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

39
40 ANSI Y14.1 Drawing Sheet Size and Format

41
42 SUBMITTALS:

43
44 General Procedures: Vendor data, whether prepared by the Subcontractor or Subcontractor's
45 subtier or supplier, shall be submitted as instruments of the Subcontractor. Therefore, prior

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to submittal, the Subcontractor shall ascertain that material and equipment covered by the submittal and the contents of the submittal itself, meet all the requirements of the subcontract specifications, drawings, or other contract documents.

Each submittal shall contain identification for each separable and separate piece of material or equipment, and literature with respect to the information provided in the specification and on the Vendor Data Schedule. Submittals shall be numbered consecutively for each different submittal.

Vendor Data Schedule: Vendor data required by the specification sections or the drawings to support design, construction, and operation of the project is identified on a Vendor Data Schedule. The Vendor Data Schedule provides a tabular listing by item number, drawing or specification reference, and description of the item or service. The type of submittal is identified by a "Vendor Data Code", and the time required to submit the item is identified by a "When to Submit" code. An "Approval" code specifies whether the submittal is for Mandatory Approval or for Information Only. One copy of routine paper or electronic file submittals are required; additional copies may be required by the Vendor Data Schedule. Electronic file submittals are preferred. Submittals that cannot be scanned or provided electronically, such as large shop drawings, will require 6 copies for Mandatory Approval and 4 copies for Information Only. Material or color samples will require 2 sets for Mandatory Approval and 1 set for Information Only.

Or Equal Material or Equipment Submittals: All "or equal" materials, equipment or systems shall be identified and submitted for approval as required by the Subcontractor Requirements Manual.

An "or equal" submittal shall contain as a minimum all operating and physical parameters necessary to show that the material or equipment is equivalent to the specified material or equipment. All parameters shall be specifically identified by the submitter in the proposal. Exceptions or differences between the specified item and the "or equal" item shall also be identified.

If an "or equal" material, equipment or system is approved, the Subcontractor shall be responsible for backup material necessary to include the material, equipment or system in the technical documents.

Vendor Data Transmittal and Disposition Form 431.13: All vendor data shall be submitted to the Contractor using the Vendor Data Transmittal and Disposition Form. The form provides the Subcontractor a method to submit vendor data and provides the Contractor a means of dispositioning the submittal. The Subcontractor shall list the Vendor Data Schedule item number, a Vendor Data Transmittal tracking number (if applicable), the drawing or specification number reference, a Tag Number (if applicable), the submittal status (e.g., Mandatory Approval, Information Only, Re-submittal, or Or-equal), the Revision Level, and the item description. The description should be complete enough that a person unfamiliar with the project can determine what the submittal includes.

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Disposition by the Contractor: The Contractor's comments and required action by the Subcontractor will be indicated by a disposition code on the submittal. The disposition codes will be classed as follows:

- (A) "Work May Proceed." Submittals so noted will generally be classed as data that appears to be satisfactory without corrections.
- (B) "Work May Proceed with Comments Incorporated. Revise Affected Sections and Resubmit Entire Submittal." This category will cover data that, with the correction of comments noted or marked on the submittal, appear to be satisfactory and require no further review by the Contractor prior to construction.
- (C) "Work May NOT Proceed. Revise and Resubmit." Submittals so dispositioned will require a corrected resubmittal for one of the following reasons:
 - 1) Submittal requires corrections, per comments, prior to final review
 - 2) Submittal data incomplete and requires more detailed information prior to final review
 - 3) Submittal data does not meet Subcontract document requirements.
- (D) "Received for Information Only." Submittals so dispositioned will generally be classified as Information Only for as-specified material and equipment.

Mandatory Approval coded vendor data will be reviewed by the Contractor and receive an A, B, or C disposition. The Contractor may provide internal review of Information Only submittals. In the event that comments are generated on an Information Only submittal, the submittal may be dispositioned B or C and returned to the Subcontractor for appropriate action. Information Only submittals without comments will receive a D disposition.

All submittals will be returned to the Subcontractor. Acknowledgment of receipt of dispositioned vendor data by the Subcontractor will not be required.

The Contractor will return dispositioned submittals with reasonable promptness. The Subcontractor shall note that a prompt review is dependent on timely and complete submittals in strict accordance with these instructions.

END OF SECTION 01300

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SECTION 02200--EARTHWORK

PART 1--GENERAL

SUMMARY:

Section Includes, but is not limited to:

1. Clearing and grubbing of vegetation as required
2. Excavating all materials encountered, or every description, for completion of the project as shown on the drawings and specified herein
3. Dust control
4. Delivery of all contaminated material excavated for completion of the project to an onsite disposal facility as indicated in the Statement of Work
5. Backfilling of all excavations as specified herein
6. Compacting all backfill as specified herein
7. Finish grading and grading for surface drainage or revegetation.

REFERENCES:

The following documents, including others referenced therein, form part of this Section to the extent designated herein.

CODE OF FEDERAL REGULATIONS

29 CFR 1926 OSHA Safety and Health Regulations for Construction,
Subpart P

SUBMITTALS:

See Section 01300, Submittals and the Vendor Data Schedule for additional submittal requirements.

PART 2--PRODUCTS

MATERIALS AND EQUIPMENT:

Satisfactory Soil Materials: Satisfactory soil materials are defined as those complying with AASHTO M145, soil classification Group A-1, A-2-4, A-2-5, and A-3.

Unsatisfactory Soil Materials: Unsatisfactory soil materials are those defined in AASHTO M145 soil classification Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7; also peat and other highly organic soils.

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Topsoil: Clean topsoil free from any toxic minerals, noxious weeds or other objectionable material.

Backfill and Fill Material: "Satisfactory" soil materials free of clay, rock, gravel larger than 3 in. in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter. Select pit run gravel is available at CFA and TRA gravel pits. Gravel pit material and use of the gravel pits shall be at no cost to the Subcontractor. Upon completion of operations involving fill material removal, the Subcontractor shall grade and reshape the disturbed areas. Sloped surfaces shall meet the requirements of OSHA 29 CFR 1926.

Equipment: All equipment and tools used by the Subcontractor to perform the work shall be subject to inspection by the Contractor before the work is started and shall be maintained in satisfactory working conditions at all times. The Subcontractor's equipment shall have the capability to perform the indicated work specified herein.

Due to the potential for TNT/RDX contamination, all equipment brought to the site slated for work in the contamination zone shall be identified to the Contractor prior to delivery and shall be clean and free of grease and oil spots where applicable, tires will be in a like-new condition, free of slits, and cracks. The Contractor reserves the right to reject equipment not meeting these standards.

The Subcontractor shall ensure that all equipment used for clearing vegetation or earthwork is fitted with appropriate safety devices that comply with all applicable Federal laws and the Health and Safety Plan (HASP) for Waste Area Group 10 Remedial Design/Remedial Action Work Plan, and adequately protect the operator and minimize exposure of workers and others to potentially contaminated material.

PART 3--EXECUTION

The Subcontractor shall be responsible for determining the method of excavation to be used for each of the areas identified on the drawings. The excavation method shall make every possible effort to remove the contaminated soil while controlling the depth of excavation and minimizing over excavation. Hand excavation may be required around site features such as fences, power poles, trees, etc. and where localized contamination does not require the use of mechanized excavation equipment.

The Subcontractor shall locate and mark existing monuments, monitoring wells, protection posts, and markers before construction operations commence and protect such items during construction. The Subcontractor shall restore or replace damaged items to original condition as required by the Contractor.

The Subcontractor shall clearly mark and post all laydown areas.

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1 DUST CONTROL:
2

3 The Subcontractor shall minimize the creation and emission of dust per IDAPA Standards
4 58.01.01.650 and 58.01.01.651 during all work activities performed under this contract. This
5 shall be accomplished by the use of water trucks and visual observation. Water based dust
6 control additives may be used with the approval of the Contractor. The Subcontractor shall
7 control the amount of water used so as not to create flowing water. Source of water for dust
8 suppression is specified in the Special Conditions.
9

10 The Subcontractor shall contain and cover excavated soil during transport to the ICDF or
11 other INEEL disposal facility by the use of liners and tarps.
12

13 CLEARING SURFACE VEGETATION:
14

15 This work shall consist of disposing of all weeds, grass, brush, shrubs, and logs from all the
16 excavation boundaries shown on the drawings for areas identified in the Remedial
17 Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II, and in
18 accordance with these specifications. Vegetation shall be removed and disposed of with the
19 contaminated soil excavation. The limits of clearing shall be the excavation boundaries
20 shown on the design drawings and as staked by the Subcontractor.
21

22 Any areas outside the designated excavation areas which are damaged or disturbed by the
23 Subcontractor's operations shall be revegetated by the Subcontractor at no cost to the
24 Contractor. Revegetation shall be in accordance with Section 02486 of these specifications.
25

26 EXCAVATION:
27

28 Description: This work shall consist of authorized excavation of TNT/RDX contaminated
29 soils and hauling of these contaminated soils to an onsite disposal facility as indicated in the
30 Statement of Work.
31

32 General Soil Excavation Requirements: In all excavation locations, the Subcontractor shall
33 contain excavation operations within the designated limits. If conditions encountered
34 warrant modification to the designated limits, the Contractor shall be notified prior to work
35 proceeding.
36

37 The Subcontractor shall mark or otherwise indicate the location of items to be protected as
38 stated in this specification, and protect these existing structures during construction activities.
39

40 Unauthorized Excavation: Unauthorized excavation consists of removal of materials beyond
41 indicated elevations or dimensions without specific direction by the Contractor.
42

43 Unauthorized excavation shall be at the Subcontractor's expense.

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Stockpiling and Disposal: No overnight stockpiling of contaminated soil shall be allowed without prior Contractor approval. Stockpiles, if approved, shall be placed on tarps and securely covered to prevent erosion.

Shoring and Bracing: The sides of all excavations shall be sloped or securely shored and braced in accordance with OSHA 29 CFR 1926, Subpart P.

Control of Water: The Subcontractor shall furnish, install and operate the equipment required to keep surface water contained inside the contaminated soil boundary shown on the drawings by constructing temporary ditches, berms or other appropriate means of control. Water shall be allowed to infiltrate into the soil or used for dust suppression.

Excavation: This activity includes, but is not necessarily limited to mobilization, surveying and marking excavation boundaries, excavation of soil, loading, transport to the disposal facility, incidental dust control, control of storm water and demobilization. Excavations may include mechanical and manual methods. Estimated quantities are shown in the subcontract documents.

SITE LOCATIONS:

Fire Station II Zone and Range Fire Burn Area:

The Fire Station II Zone and Range Fire Burn Area is approximately 0.13-km² (33-acres), but the area of contamination is fairly well defined and restricted to a 752-m² (900-yd²) area of scattered TNT fragments and explosives stained soil as shown on Figure 3-1 of the DOE/NE-ID-11127 Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II document. The estimated volume of soil to be remediated is 76.5-m³ (100-yd³).

Experimental Field Station:

The Experimental Field Station is approximately 0.07-km² (17.7-acres), but the area of contamination is restricted to a single small area approximately 511-m² (611-yd²) as shown on Figure 3-2 of the DOE/NE-ID-11127 Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II document. The estimated volume of soil to be remediated is 76.5-m³ (100-yd³).

Land Mine Fuze Burn Area:

The Land Mine Fuze Burn Area is approximately 0.10-km² (27-acres), but the area of contamination is restricted to a smaller area as shown on Figure 3-3 of the DOE/NE-ID-11127 Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II document. The estimated volume of soil to be remediated is approximately 153-m³ (200-yd³); however, based upon recent visual observations at

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the site, the actual volume is anticipated to be much less at approximately 7.6-m^3 (10-yd³).

National Oceanic and Atmospheric Administration (NOAA):

The National Oceanic and Atmospheric Administration site is approximately 0.18-km² (46-acres) as shown on Figure 3-4 of the DOE/NE-ID-11127 Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II document. The TNT fragments and TNT/RDX contaminated soil is widespread throughout the entire site and is known to exist beyond the areas previously sampled. The estimated volume of soil to be remediated is 268-m^3 (350-yd³).

Naval Ordinance Disposal Area (NODA):

The Naval Ordinance Disposal Area is approximately 0.56-km² (138-acres), but the area of contamination is well defined and believed to be limited to a single crater as shown on Figure 3-5 of the DOE/NE-ID-11127 Remedial Design/Remedial Action Work Plan for Operable Units 6-05 and 10-04, Phase II document. The estimated remediation volume of soil is 38-m^3 (50-yd³).

BACKFILLING AND GRADING:

General: Backfill requirements are anticipated to vary by site. The excavations shall be cleared of all trash and debris prior to backfilling or grading. Excavations that constitute a physical hazard as determined by the Contractor shall be backfilled. All backfill or fill material shall be free from trash, organic matter and frozen particles. Backfilling is required when the excavation depth is greater than 1 ft. from the original grade. Backfilling shall be done only when approved by the Contractor. Backfill material shall consist of pit run gravel and the top six inches of material being topsoil. In excavations that are shored, shoring and formwork shall be removed or raised as backfill or fill is placed. Areas where only the top 3 to 12 inches of soil are removed may not require backfill if the surface drainage can be maintained as to not allow ponding and there is sufficient topsoil to support revegetation. Disturbed areas identified as not supporting revegetation shall be backfilled with six inches of topsoil. Upon completion of excavation work at a designated area, the sides of all excavations not being backfilled shall be graded to a smooth contour (4:1 maximum slope). In all excavations, modifications to the site may be made by grading or other means to provide drainage of surface water from the site.

Placement: Concentrated dumping of backfill material into excavations will not be permitted. All material must be placed in uniform layers not to exceed 8-in. loose measurement and brought up simultaneously. No water shall be used for placing, settling or compacting backfill or fill except to obtain optimum moisture content.

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Compaction: Unless otherwise indicated, compact all backfill using 3 to 4 passes by mechanical devices such as rollers, vibratory compactors or mechanical tampers. Each 8-in., maximum, loose measurement lift shall be compacted before the next lift is placed thereon.

DECONTAMINATION:

The TNT/RDX decontamination of all Subcontractor equipment or tools shall be the responsibility of the Subcontractor.

METHOD OF MEASUREMENT:

Dust Control: Dust control will not be measured for separate payment.

Clearing/Mowing Vegetation: Clearing vegetation will not be measured for separate payment.

Excavation: Excavation will be measured by the cubic yard.

Backfill/Borrow: Backfill material including pit run gravel and topsoil will be measured by the cubic yard in its final in-place position.

BASIS OF PAYMENT

Dust Control: No separate payment will be made for dust control. It shall be included in the unit price for excavation.

Clearing Vegetation: No separate payment will be made for clearing vegetation. It shall be included in the unit price for excavation.

Excavation: Payment will be made at the contract unit price per ton of material removed. The payment shall be full compensation for all work associated therewith, including but not limited to, surveying of excavation boundaries and topography, clearing vegetation, excavation of soil and loose surface rock, loading, incidental dust control, and control of storm water.

Backfill/Borrow: Backfill/Borrow will be paid for at the contract unit price per cubic yard of soil in its final in-place location. The cost shall include loading, hauling, grading and compacting the material from onsite borrow pits to various excavation areas.

FIELD QUALITY CONTROL:

Topographic surveys may be conducted by the Contractor prior to the start and upon completion of the excavation work to verify quantities. The Subcontractor shall provide confirmatory final survey.

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- 1 The Subcontractor shall be responsible to in-process inspection during execution of all work.
- 2 Surveillance will be performed by the Contractors Representative to verify compliance of the
- 3 work to the drawings and specifications.
- 4
- 5 END OF SECTION 02200

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1 SECTION 02486--REVEGETATION

2
3 PART 1--GENERAL

4
5 SUMMARY:

6
7 Section Includes, but is not limited to preparing seedbeds, sowing grasses, applying fertilizer
8 and applying mulch to revegetate disturbed sites.
9

10 Related Work: Section 02200-Earthwork

11
12 SUBMITTALS:

13
14 Seed Mix Certification: The Subcontractor shall submit seed mix certification for approval
15 by the Contractor 8-days prior to revegetation.
16

17 Soil Analysis: The Subcontractor shall submit results of the soil and fertilizer analysis for
18 approval by the Contractor 8-days prior to revegetation.
19

20 PART 2--PRODUCTS

21
22 MATERIALS:

23
24 Topsoil: Clean topsoil free from any toxic minerals, noxious weeds or other objectionable
25 material.
26
27

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Seed Mix: The grass species shall be applied at the rate specified below.

The following grass mix shall be used for all disturbed areas:

SPECIES	RATE OF APPLICATION (POUNDS PER ACRE PURE LIVE SEED)
Green Rabbitbrush (<i>Chrysothamnus viscidiflorus</i>)	0.5
Indian Rice Grass "Rimrock" (<i>Achnatherum hymenoides</i>)	2
Thickspike wheatgrass "Bannock" (<i>Elymus lanecolatus</i> ssp. <i>lanceolatus</i>)	2
Bottlebrush Squirreltail (<i>Elymus elymoides</i>)	2
Western wheatgrass "Rosanna" (<i>Pascopyrum smithii</i>)	2
Needle and thread grass (<i>Stipa comata</i>)	2
Silverleaf lupine (<i>Lupinus argenteus</i>)	1
Munro globemallow (<i>Sphaeralcea munroana</i>)	1
Total	12.5

Fertilizer: The Subcontractor shall perform a soil analysis of the soils disturbed by excavation and also the identified borrow source for topsoil to determine the appropriate fertilizer mix and application rates for successful growth of the specified seed mix. The Subcontractor shall identify to the soil analysis laboratory that revegetation will be with native grasses. All costs associated with the soil analysis and fertilizer requirements shall be included in the subcontract price.

Mulch: Mulch shall be processed grass straw.

EQUIPMENT:

Seedbed Preparation: Disks, harrows, roller harrow-packers (culti-packers), tooth type harrows, shovels, or other similar equipment.

Seeding and Fertilizing: Brillion seeder, or other similar equipment.

PART 3--EXECUTION

Season of Work: Seeding shall be done between October 1 and November 30 or February 1 and March 20. Specific ideal seeding times within these windows shall be as required for

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proper seedbed preparation. Areas to be seeded shall be maintained reasonable free of weeds. Weeds shall be kept from going to seed.

Seedbed Preparation: Soil shall be tilled a minimum depth of 3-inches. The seedbed shall be firm below seeding depth and well pulverized and loose on top. It shall be free of clods and weeds. Seedbed preparation shall not be performed when soil conditions are not suitable for tilling: too dry, too wet, frozen, etc. Tillage shall produce cross-slope furrows on slopes.

On areas subject to severe erosion, the extent of seedbed preparation shall not exceed that which can be seeded in one day.

Fertilizing: Fertilizing shall closely follow seedbed preparation. Fertilizer shall not be mixed with seed. Fertilizer may be drilled or broadcast. Fertilizer shall be applied at a rate of determined by the soil analysis.

Seeding: Seeding shall closely follow fertilizing. If the seedbed has been disturbed, then the Subcontractor shall prepare the seedbed again. Seeding work shall not proceed until the seedbed has been inspected. Seeds shall be thoroughly mixed prior to application. Seeds shall be uniformly applied at the previously specified rate. Seeds shall be buried 0.25 to 0.75 inches. Seeding shall not be performed when weather conditions are unfavorable: high wind, heavy rain, etc.

Mulching: Mulch shall be spread uniformly at a rate of 1 ton per acre. Mulch shall be anchored into the soil to a depth of at least 2 in. and with no more than one pass of the equipment. Mulching shall not be performed when wind interferes with mulch placement.

Protection: Traffic over seeded area shall be prohibited by the Subcontractor during all work activities performed under this contract.

METHOD OF MEASUREMENT:

Revegetation: Revegetation will be measured by the acre using field survey.

BASIS OF PAYMENT:

Revegetation: The accepted quantities of revegetation will be paid for at the contract unit price per acre of revegetated area. This price shall include seedbed preparation, seeding, mulching an anchoring, and fertilizing.

FIELD QUALITY CONTROL:

Surveillance will be performed by the Contractor's Representative to verify compliance of the work to the drawings and specifications.

END OF SECTION 02486